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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

NEWS IN BRIEF

HEW Board to Report On DP and Privacy

WASHINGTON, D.C. – The high-level government committee formed to examine computers and privacy, particularly as impacted by personal data systems, is ready to report to the government and the American public.

Formed by Elliot Richardson when he was secretary of the Department of Health, Education and Welfare (HEW), the committee will hand its bulky report to Richardson and the current HEW chief, Casper Weinberger, July 31.

Although results were not available, sources close to the committee predicted stringent measures would be included in the recommendations. There was also speculation that several legislators are ready to propose laws to implement these recommendations.

Officially known as the Secretary's Advisory Committee on Automated Personal Data Systems, the 24-person group met several times during 1972, with witnesses discussing their systems, and members of the public commenting on the psychological impact of computer-based personal systems.

Specific measures are expected to be recommended to protect the privacy of people whose names are contained in personal data banks, such as those maintained for credit purposes and/or government assistance.

That'll Teach a Programmer To Stick With His Job

PAMPLONA, Spain – If negotiating the intricacies of faulty do-loops and dead-end branches in programs doesn't add enough zest to your life, you might try the narrow, half-mile course at Pamplona's recent annual "running of the bulls."

James Glass, a vacationing U.S. Civil Service computer programmer, tried just that and was rewarded with plenty of excitement – as well as a nine-inch gash in his leg from a 1,000-pound bull.

"I guess it's my last run with the bulls, at least for this year," said Glass, who will be recovered enough to go back to running programs in a few days.

SPECIAL REPORT
★ Software Makes ★
Hardware Work
Page 21

The Cracked Code Caper

By Don Leavitt
Of the CW Staff

COLLEGEDALE, Tenn. – At what point does a system become insecure and who is responsible if it does?

Those are the questions raised by a small time-sharing vendor now offering two separate ways to "crack" the file-scrambling code provided by Hewlett-Packard.

Spectrum, Inc. is "extremely happy" with its HP 2000F, but quite concerned about the apparent weakness in the system's data security protection. With the release of the unscrambling routines, the user said, "anyone who is using the HP scramble code is now insecure."

HP spokesmen admitted that Spectrum and students at Southern Missionary College have cracked the code, but claimed that this doesn't make the system "insecure" as long as security at the user ID and password level is maintained. And that, they added, has always been a problem for the equipment managers, not the manufacturers.

Spectrum serves half a dozen or more colleges in the Chattanooga, Tenn., area with both administrative and academic applications. It will send copies of the "cracking" routines to anyone who will pay the $5 President Glenn Holtkamp estimates it costs to reproduce the tape coding.

He said his company has no interest in making money on the offer but just wants to apply pressure on HP to "do something" about the code system.

The code-cracking effort took two forms this spring, Holtkamp explained, when his staff heard students at the college were working on the project. The students' particular target appears to have been a quiz file – complete with answers – maintained by one of their professors on Spectrum's HP 2000F.

Holtkamp became concerned and

(Continued on Page 4)

IBM's Double-Density 3330 Disk Subsystem Arrives

By Michael Weinstein
Of the CW Staff

WHITE PLAINS, N.Y. – By doubling the number of cylinders per disk pack and using different read/write heads and associated electronics, IBM is offering virtual storage users a double-density 3330 disk storage subsystem.

This disk system was previously called Iceberg in IBM documents uncovered at the IBM/Telex trial. [CW, May 9].

IBM has tied usage of the new double-density disk systems to virtual memory operating systems. Hence, the subsystem is only available to users of 370 models 135, 145, 158 and 168, IBM said.

Components of the new disk subsystem are the 3333 Disk Storage and Control Model 11, 3330 Disk Storage Model 11 and 3336 Disk Pack Model 11.

The double-density Model 11s accommodate the 3336 Model 11 Disk Pack which holds up to 200M bytes of information. The Model 1 Disk Pack has a storage capacity of 100M bytes.

With the exception of storage capacity, operating specifications of the Model 1s and Model 11s are identical (see chart on Page 2). No changes have been made in the controller, IBM said.

Software Another Story

While hardware specifications are similar, software support is not: the 3330/3333 Model 11s are restricted to run under OS/VS1, OS/VS2 or VM/370.

The older Model 1s were less software restricted and could run on the 360/195 and any 370 system from the Model 125 through to the Model 195 using DOS, OS and the virtual operating systems.

One feature incorporated into the double-density subsystem enables the drives to operate independently during "erase" operations. Thus, the data channel and control unit are permitted to serve other I/O devices during erase operations and the user receives more effective time used for seeks and reading operations, an IBM spokesman said.

Another user option is the ability to mix Model 11 units with Model 1 boxes in the same subsystem as long as the total system runs under a VS operating system. For example, up to three 3330s – in any combination of new and previous

(Continued on Page 2)

B 1728 Multiprograms

Burroughs Adds A Top to 1700s, New Software

By Michael Weinstein
Of the CW Staff

DETROIT – By enlarging basic central processor components (main memory and control memory) and adding new peripherals, Burroughs has moved to provide an easy growth path for B 1700 users.

Burroughs users may now migrate to the B 1728 when they outgrow the previous top-of-the-line B 1726.

From a hardware approach the basic difference between these two models is that the 1728 allows users to attach about three times the main memory and about twice the control memory.

From a software approach, the 1728 includes new communications software that enables the system to function either as a stand-alone computer or as a satellite system in a data communications network.

The B 1728 can accommodate up to 16 data communications lines and communicate with other Burroughs computer systems, terminal systems or remote job entry systems.

Since the B 1700 series has a multiprogramming capability, the new data communications features can be mixed with other jobs in process at the same time.

No change has been made in the B 1728's processor or control memory

(Continued on Page 4)

Removing Old Charges

FBI's NCIC Has Problems

By Michael D. Sorkin
Special to Computerworld

DES MOINES, Iowa – David Harkness isn't absent without official leave from the Marine Corps and he isn't a deserter.

He isn't even a Marine.

But the FBI's crime computer didn't understand that. As far as it knew, the 22-year-old Harkness had been AWOL since January 1972.

On May 28, 1973, Des Moines police arrested Harkness on a traffic charge. At first Harkness was told he could pay a $15 fine and would then be free to leave.

Then, Harkness said, an officer came back to his cell in the police station and told him: "Bud, you're not going anywhere. The Marine Corps got a hold on you. A detective then showed Harkness a copy of the computer printout listing Harkness as being AWOL from the Marines and a deserter.

That wasn't the first such experience for Harkness. On June 26, 1972, Harkness was also arrested by Des Moines police, also because the computer said he was AWOL.

That arrest occurred more than a month after Harkness had become a civilian. His discharge papers show he left the service on May 3, 1972.

After Harkness's discharge from the Marines – where he was indeed once disciplined for being AWOL – Harkness was convicted of theft of government auto repair equipment. He was put on probation, now has a job as a security officer and wants to attend real estate school.

Assistant Des Moines Police Chief Harold Fryman said police aren't to blame for the arrests because they were only following the computer's instructions.

The problems illustrated in the Harkness case are only the latest difficulties confronting the FBI's National Crime Information Center, which when completed,

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On the Inside

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Advantages, Disadvantages

Study Looks at VS on Major 360 Models

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – As part of its analysis of the 360 Series adaptability to the addition of virtual features, Compata, Inc. reviewed most major models in the 360 line. Both the advantages and disadvantages of each machine were listed.

Last week *Computerworld* presented a detailed study by Compata, Inc. outlining specific methods to implement a virtual storage capability on 360 mainframes. This article analyzes each major 360's advantages and drawbacks to adding VS.

The 360/30 could be improved with virtual storage because the machines are typically "heavily I/O-bound," and programs are limited in size by the small available real memory, the report said. Most processing is "heavily character string and I/O-limited and would benefit from the long byte string instructions of the S/370."

This would be offset by the fact that a good paging device is not available for this system and the CPU is slow, so there "is little benefit from high levels of multiprogramming."

Also, the multiplexer channel seriously limits CPU performance and the only acceptable 370 operating system would be DOS/VS which is limited to one paging device and will not support high paging rates.

There are also not enough selector channels to dedicate one to a paging device so spooling and paging might conflict, the report said.

Virtual storage would be feasible on the Model 30 but such capabilities would be limited and good performance could be expected only for a system with a minimum of 128K.

The Model 40 machine has a faster CPU and uses a two-byte wide memory. But full 24-bit addresses are not placed on the Model 40 address bus. This would be significant for both 360 and 370 instructions which have operands that are more than 16 bits long, and provision would have to be made for avoiding the table lookaside buffer search for memory accesses to obtain 32- and 64-bit operands. In all virtual approaches on the Model 40, "extra hardware will have to be added for the channel indirect addressing bit."

While having many of the same limitations as the Model 30, a 360/40 with its main memory extended to 512K could be run under OS/VS1. Such a system "would be degraded less by the paging rate limitations imposed by the 2314 disks."

But memory is still limited and performance would not be as good as an OS/MVT system.

Model 50

Dynamic address translation would be easier to add to the 360/50 machine because of its full 24-bit addressing. Since memory address exceptions are hardware detected, the DAT hardware could control these without changing the microcode, the report said. But some hardware changes would have to be added for "implementing channel indirect addressing."

The Model 50 can support a large main storage through the addition of an LCS of 2M bytes and this configuration could run under OS/VS1 while a 3M byte LCS system might support OS/VS. These would include 512K of main memory but neither would "outperform an OS/MVT system," Compata concluded.

Because of its larger memory expansion capabilities and the block multiplexer support of both 3330 and 2305-type storage devices, virtual storage would be attractive on the Model 65, especially for program development activities.

But programs which generate "modest page fault rates" could degrade performance although such a situation would not be "much worse than on the 370/158," the report said.

This machine is close in many respects to the 360/67 which already has a DAT capability, but the microprograms of the two systems are different.

In normal operation the Model 65 has a large amount of CPU wait time so the system could benefit from "higher levels of multiprogramming." The system can support up to seven channels and the main memory protect stores contain extra bits for reference and change recording. In addition, the CPU and channels are "truly independent."

But microcoding would be difficult because of the "wide control word and high degree of parallelism" in the CPU. The local store does not contain any spare registers so microcoding of extended precision floating-point instructions might require an additional local store.

3330 Double-Density Unit Debuts

(Continued from Page 1)

models – can be attached to the new or existing 3333 models.

Installed 3333s or two-drive 3330s can be field-converted to Model 11s. This conversion involves the physical substitution of the new read/write head and electronics into selected 3330s and/or 3333s. This conversion takes about 23 hours and includes one hour devoted to system checkout, IBM said.

While there is no conversion cost to rental users of the 3330 subsystem, users who have purchased their systems will have a one-time charge of $26,000 per two-spindle box.

Features	3336 Model 1 Disk Pack	Double-Density 3336 Model 11 Disk Pack
Capacity/pack	100M bytes	200M bytes
Cylinder/pack	404	808
Data track/ cylinder	19	19
Max. byte/ track	13K	13K
Max. byte/ cylinder	248K	248K
Av. access time	30 msec	30 msec
Data transfer rate	806 kbyte/ sec	806 kbyte/ sec
Compatible mainframes	360/195 370/125 and up	370 Models 135, 145, 158 and 168
Price/pack	$775	$1,150

Comparative Figures of Old and New Disk Packs

Existing 3336 disk packs can be factory converted to the Model 11 at a cost of $650 for each disk pack. This operation takes 10 working days (plus shipping time) and involves resurfacing the disk with a smoother and thinner finish and fitting on a new hub of different dimensions. The new disk pack cannot be used with previous 3330/3333 drives.

About $500 More/Drive

Purchase price for the Model 11 3336 disk pack is $1,150. A Model 1 3336 disk pack costs $775.

Rental for a 3333 Model 11 under the standard rental plan is $2,174/mo and $1,850 under the two-year Extended Term Plan. Comparable rental prices for the Model 1 3333 are $1,627/mo for the standard plan and $1,385/mo for the Extended Term Plan.

Rental for a new double-density 3330 is $1,845/mo under the standard agreement and $1,550/mo under the extended plan. Comparable prices for Model 1s are $1,300/mo and $1,092/mo.

Purchase prices range from $74,000 to $87,000.

First customer shipments of the new 3330/3333 and 3336 models and field conversions for existing models are scheduled for March 1974.

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Its Operating Problems Slacken, Service Bureau Can Smile Now

By Ronald A. Frank
Of the CW Staff

MERRIMACK, N.H. – When a vendor becomes responsive to the needs of a user, no one could be more pleased than the customer.

This is the case at Compro, Inc., which two months ago was having little success in operating its Control Data 3200 system [CW, April 18].

The small service bureau had been plagued by a series of operating problems which were causing an unprecedented amount of downtime. The CDC system had been installed for more than seven months but was not yet on rent because the user had refused to sign off on the system.

Contract Violation Blamed

The vendor's failure to deliver the features promised as part of its contract with the user were largely to blame for the operating problems at Compro, according to Carl Findlay, Compro's president. CDC had been obligated to provide IBM-compatible Cobol, a communications interface to connect Compro's Viatron terminals to the 3200 and other capabilities.

But since then things have improved greatly, according to Findlay. The long-awaited communications interface between his CPU and the Viatron terminals is now allowing on-line entry of data. A sixth disk drive has given the 3200 a spare capability that helps avoid extensive downtime.

CDC concentrated extensive systems and technical help at Compro and the results were positive enough that Findlay signed off on the mainframe and began monthly rental payments as of June 10. The 3200 is now in operation most of the time and jobs are being delivered when promised.

Direct Contact Helps

The most important benefit of the new vendor support is that Compro now has a "mainline into the CDC corporate specialists" that can solve problems, Findlay said. These direct contacts often provide more immediate help than routine messages to the local branch, he added.

Some operating problems still remain at Compro but Findlay is satisfied that CDC is giving its best efforts to help.

Doctor Sees Computers as Means To Complete Drug Harm Analysis

TORONTO, Ont. – What will 10 years of popping pills really do to you? One scientist believes computers could be used to find out.

According to Howard B. Newcombe of the biology and health physics division of Atomic Energy of Canada Ltd., computers could be used to detect harmful elements in new drugs and find out whether "things people are exposed to – such as new drugs or chemicals in the environment – are good for them or bad for them."

For example, Newcombe said, computers could tell us more quickly than is currently possible whether a new drug taken by pregnant women causes abnormalities in their unborn babies.

A vast amount of information about people now kept by computers could be used to warn against potential health hazards, he suggested. It could reveal, for instance, whether people living in one community or working in a certain type of industry face a high risk of cancer. If a high rate among certain groups should appear, the substance causing the cancer then might be tracked down.

Newcombe suggested pharmacists might be paid to record information on persons for whom a new drug is prescribed. The information would be fed into a central computer, cross-matched with birth, death or hospitalization records, and thereby reveal if persons taking the drug suffer any bad effects.

Newcombe said the main obstacle to this method has been fear of loss of privacy and he agreed there must be adequate laws to safeguard confidentiality.

Health Policy Evaluated

QUEBEC – A $175,000 computer program will help shape the direction of health care in Quebec by forecasting allocation of services and funds over the next 10 years.

Called Medics, the program was started over a year ago by the social affairs department to promote health service efficiency while holding down rising costs.

One of Medics' main purposes will be to evaluate the impact of the community service centers being set up under the province's health services reorganization.

Although the results so far are preliminary and not very reliable, according to program director Andre Hurtubise, one "reasonable" prediction is that health costs will increase by 150% over the next 10 years if current trends continue.

Data for the program is based primarily on the Quebec medicare system and the province's hospital insurance program.

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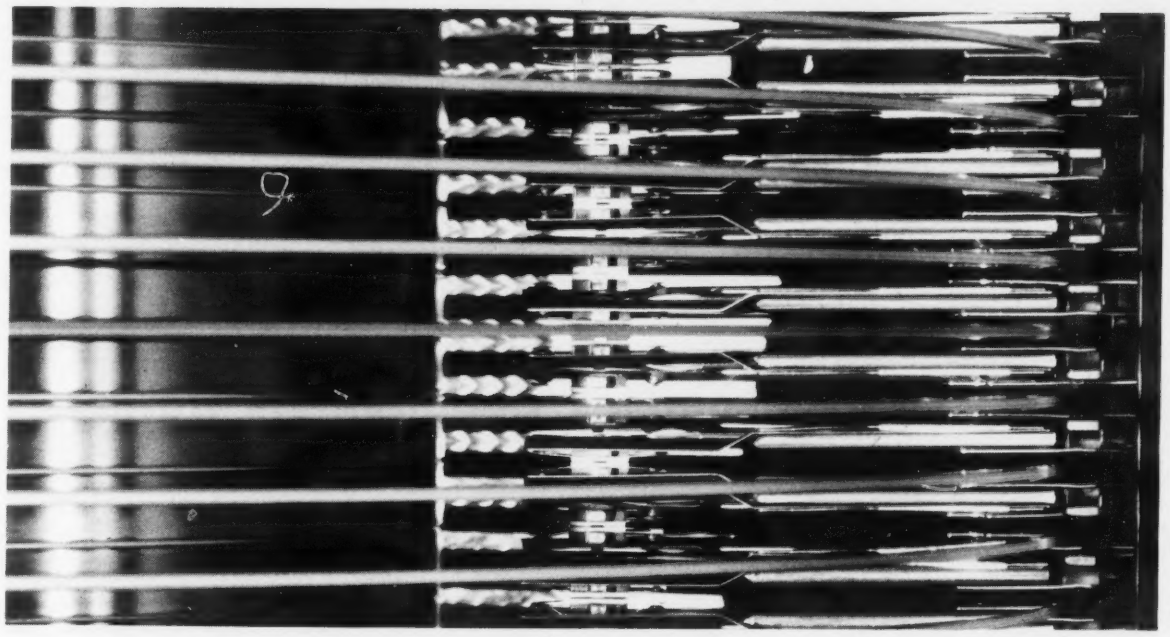

The 3330-compatible disk subsystem by Ampex that operates up to 16 drives on a single controller.

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IBM-U.S. — It's a New Courtroom With Same Script

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – A small basement courtroom in the Federal District Court here was the scene last week for the latest of the numerous inconclusive hearings on whether IBM should be fined for contempt of court for refusing to turn over documents to the government for use in its antitrust case.

And even though the courtroom was new for the hearing, the script remained essentially the same as in past hearings, although it was supposed to be limited to the issue of damages if IBM was to be found guilty of contempt at the request of the government.

Lead government attorney Raymond Carlson declared that IBM was engaging in a "power struggle" with the court and he was asking for restrictive penalties against the company for its refusal to turn over the 1,200 questioned documents.

Stiff Fine Sought

Because it was showing its contempt for an order entered by Judge David Edelstein requiring it to turn over the documents, IBM should be given a stiff fine, Carlson said, renewing his request that the firm be ordered to pay an amount equal to 5% of its daily net income for the alleged contempt.

Carlson once again pointed out that the order was in effect since the Supreme Court had refused to grant IBM a stay in the matter and that it should be obeyed immediately.

Otherwise he hinted that the government's preparation of the case will be slowed.

On the other side Judge Simon Rifkind, whose firm is representing both IBM and its outside legal counsel of Cravath, Swaine, and Moore, argued that Edelstein should enter an order just against the legal firm and impose a light sentence in order to speed up the procedure.

Rifkind claimed that a contempt citation against IBM would not be as easy to appeal as one against its lawyers.

He said there have been some cases that might indicate that a citation against IBM itself would not be appealable at all, so the only way to get the matter heard on its merits might be a citation against the legal firm.

The 1,200 documents IBM claims are privileged under the attorney-client relationship have now been cut in about half since some of the documents have been released by IBM.

The firm claimed that it "inadvertently" waived its claim to privilege when it accidentally turned the documents over to Control Data in its case against IBM.

However, Edelstein disagreed and said the claim to privilege has been definitely waived by that action and 13 months ago he ordered IBM to turn them over to the government.

That decision was appealed and just last month the Supreme Court refused to grant an IBM request of a stay until the court decides on hearing the case.

New Model Goes to the Top of Burroughs Line

(Continued from Page 1)

cycle speed – compared with the B 1726 – which both cycle at 167 nsec. However, the maximum capacity of the control memory has been increased from 4K bytes to 8K bytes.

The change to main memory also involves size, with speed remaining unchanged. The maximum memory capacity of the B 1726 is 98K bytes while the newer B 1728 has a maximum capacity of 262K bytes.

Model	B1726	B1728
Central Processor		
Cycle time (nsec)	167	167
Main Memory		
Min. capacity (bytes)	25K	66K
Max. capacity (bytes)	98K	262K
Read cycle time (nsec)	667	667
Control Memory		
Min. capacity (bytes)	2K	6K
Max. capacity (bytes)	4K	8K
Read cycle time (nsec)	167	167

The new top-of-the-line B 1728 is a larger version of the previously announced B 1726.

New Peripherals

A fast access, head-per-track disk memory subsystem is offered with the B 1728 and is integrated with the central system to provide on-line storage capacities ranging from 8.1M bytes to 40.5M bytes. This memory subsystem has an average access time of 20 msec.

Second Peripheral

A second peripheral is an expanded disk pack subsystem that incorporates removable disk and provides a storage capacity ranging from 87.6M bytes up to 525.6M bytes, a transfer rate of 625 kbyte/sec and an average access time of 42.5 msec.

The B 1278 can also use removable cartridge disk drives providing capacities ranging from 4.6M bytes to 36.8M bytes, and an average access time of 80 msec.

Other peripherals released for use with the B 1728 include a new multi-line data communications controller, line printer and expanded range of magnetic tape subsystems and card equipment.

Peripherals previously announced for smaller models within the B 1700 series are also usable on the B 1728.

Prices for a B 1728 system, depending upon mixture of peripherals and subsystems specified by the user, can range from $240,000 to $560,000 for purchase, with comparable monthly leases running from $5,300/mo to $12,500/mo.

Pricing and operating specifications put the B 1728 in competition with other computers in the IBM 370/125 class.

First deliveries are scheduled for the third quarter of 1973.

Software Buoys Small System User

By Don Leavitt
Of the CW Staff

DETROIT – Software announced for the B 1728 indicates Burroughs' continued support of the small system user, through a full range of high-level languages and package applications, and a new emphasis on communications systems, through a pair of specialized languages for working with terminals.

The Network Definition Language (NDL) has been available on larger medium-scale systems like the B 3700 and B 4700 and is being added to the B 1700 repertoire to cope with the new system's enhanced communications facilities. The NDL compiler converts source statements into tables and object code required for a custom communications network controller.

It allows the user to define his network in simple syntax. Once generated, the controller program performs line discipline, buffer management, message queuing and generally processes and supervises the flow of messages between terminals and the user's programs, written in Cobol, RPG or User Programming Language (UPL).

In effect, it allows the user to deal with communications devices the same way he works with more conventional peripherals.

UPL is an Algol-like compiler language that Burroughs expects the more experienced programmer to use to solve complex decision-oriented problems, including message control systems for data communications, data compression and expansion routines and binary analysis of data. This provides a means of handling special cases that are beyond the scope of NDL, Burroughs explained.

The new languages are available under license agreements. NDL costs $50/mo and UPL goes for $200/mo, Burroughs said.

Otherwise, the Master Control Program appears to be essentially the same as provided with the smaller 1700s last year. It handles dynamic allocation of system resources, including memory, but is not completely compatible with the MCP on larger, older systems such as the B 5000 line.

Programmers can use Cobol, RPG, Fortran and Basic language processors to build their own source codes, or a user can install any of the various Business Management Systems of programs appropriate to his line of business. These BMS packages are separately priced.

NCIC Has Some Problems Updating Its Data

(Continued from Page 1)

will have 45,000 computer outlets across the nation.

At the root of the difficulty, critics of the FBI system say, is the lack of uniform and adequate federal standards for the computer system. Gov. Francis Sargent of Massachusetts decided to keep his state out of the NCIC network until federal officials can insure that individual rights will be protected. [CW, July 11]

In the Harkness case what was lacking was an enforceable federal requirement that the FBI be notified when a wanted person has been arrested or when the charge against him has been dismissed.

Howard Fields had an experience similar to Harkness's.

He was returning to Des Moines recently from Peoria, Ill., where he had a job as a painter. Police stopped him on a speeding charge. When the authorities ran his name through an NCIC check, they were told Fields was wanted in Topeka, Kan., on a forgery charge.

From jail, Fields called Guy Davis in Des Moines. Davis, a federal probation officer, informed both the Illinois State Police and the local sheriff's office that the forgery charge was out-of-date. Fields had already been convicted and was on probation under the custody of Davis.

"They wouldn't believe me," Davis recalled afterwards.

Davis said Fields was released the following day and walked and hitchhiked back to Des Moines since his two companions and their car had already been released.

"I wonder whether we should have all this doggone computerizing or not," said Davis, who has 200 probation clients in his custody. "It seems like once we get this information into the computer, it's there and nobody seems to want to take it off."

'Happen All the Time'

Davis said similar incidents "happen all the time. What can you do?" Davis is also Harkness's probation officer.

A military policeman stationed in Des Moines said one problem for the military is the length of time it takes to enter and remove a charge on the NCIC system. It usually takes 60 days to enter a charge on the crime computer, but "it takes almost as long to get it off."

FBI Special Agent Norman Stultz, who is in charge of NCIC, said it is the responsibility of each of the participating police departments or military police units to follow up each charge with a disposition to the FBI.

Asked if the FBI ever punishes an agency for failure to report dispositions, Stultz replied: "Not in individual cases. If there were flagrant violations, we would discontinue service to them. There haven't been any instances like that which have come to our attention."

A Des Moines police sergeant, who asked not to be identified, confided that it is not unusual for police to have an NCIC AWOL "hit" on servicemen who have already been discharged. Police Lt. Clifford Layton of the department's record division said he can remember about four such cases.

Stultz of the FBI said he could notify Marine police to check into the Harkness case, but that the FBI would be unable to update the records itself. "They have to remove the charge. We can't," said Stultz.

The Cracked Code Caper Unraveled

(Continued from Page 1)

asked one of his staff, Pete Sowder, to look into the situation. He wasn't to spend a lot of time on the project, Holtkamp said, "but if he could spend half an hour each evening on the terminal he had at home and come up with something, I'd sure appreciate it."

Sometime later, Sowder called Holtkamp to say he had indeed "cracked" the code. He had made one of the scrambled files in Spectrum's "public library" legible. Holtkamp told him not to tell anyone but to try his technique on a few more files to make sure it was a universal unscrambler. "If it is, we'll see if we can get HP to do something about it."

Later that same evening, Holtkamp recalled, the night-shift operator called him to say that apparently some students had succeeded in unscrambling parts of the file, and were still on the machine unmasking more.

Checking further, Holtkamp found the collegians had indeed gotten into the professor's quiz file and were gleefully producing printouts of both the tests and the answers. And they were using a different technique from Sowder.

One technique examined the file and determined the "mask" that had been applied to scramble it. Once the user was given this mask, he could apply it to the scrambled file and get clear text.

The other approach appeared to have much the same logic but internalized the operation so that the user never was notified what mask had been used on a given file. This technique, developed by Sowder, produced clear text directly from a single run of the decoder program.

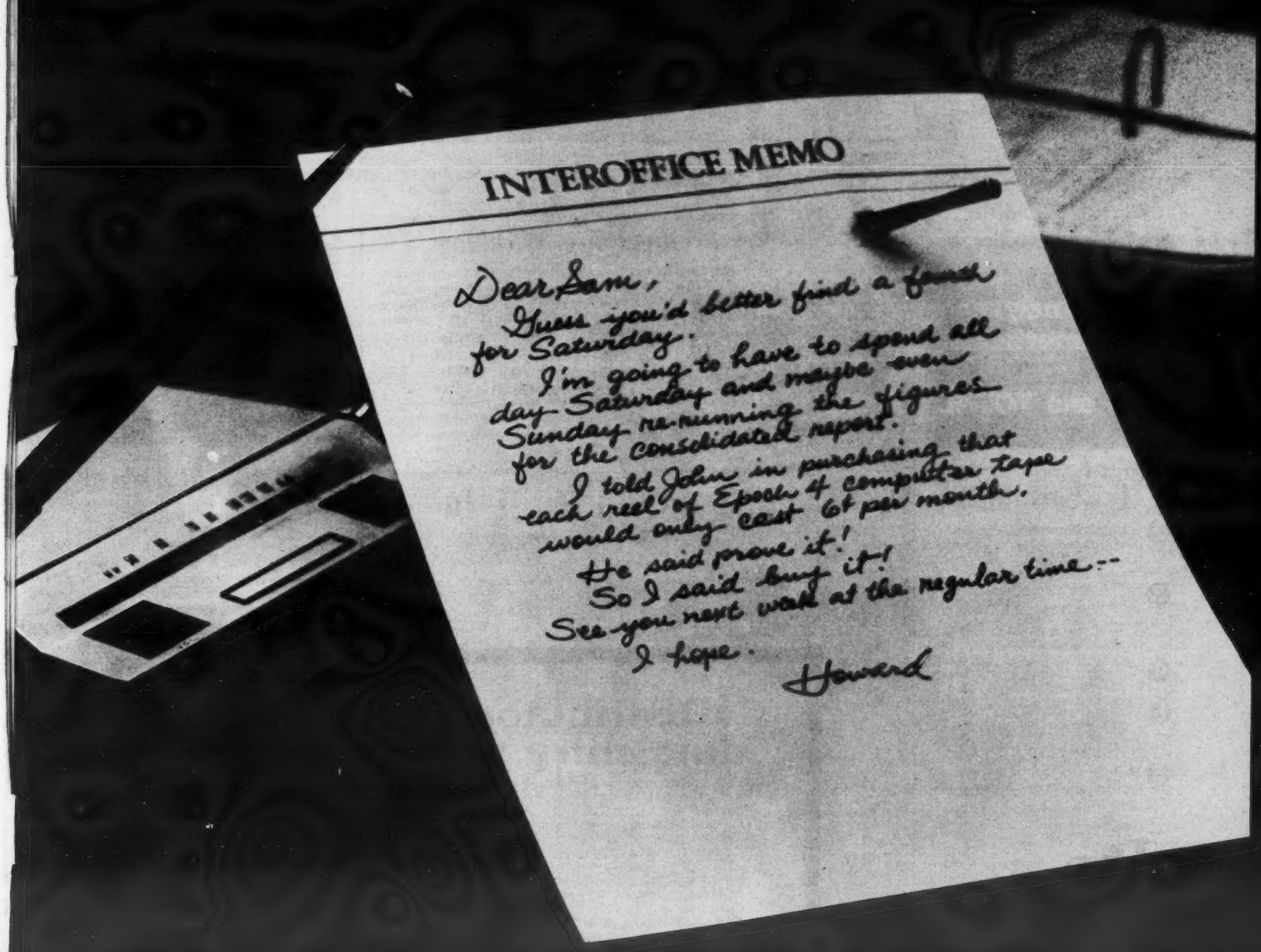
Holtkamp notified HP of the situation but the company "didn't see it as a big priority issue. 'Well, we'll work on it,' they said; "meanwhile, why don't you change the file name or develop your own interim solution?' "

Spectrum feels it needs a "solution" by September in order to reassure its clients their files are safe. That is why the cracking routines have been released at this time, Holtkamp said.

Meanwhile, the company has begun to implement its own masking system which, Holtkamp said with understandable modesty, "seems to be unbreakable."

Spectrum, Inc. is located on the grounds of Southern Missionary College here in Collegedale, 37315.

When that bargain tape loses half the figures in your financial report, here's a note to your regular golf partner.



GRAHAM MAGNETICS
Graham, Texas 76046

Assessors Unsure of Valuation System

By Ken Shonk
Of the CW Staff

PHOENIX – A behind-schedule computer program being written for the state Department of Property Valuation in-house for a totally computerized property appraisal system has touched off a storm of controversy over introduction of the system for residential properties.

"When plans for the computer appraisal system were made," according to Herb Foster, chief appraiser for Maricopa County, "computer programs for commercial and industrial-commercial property and for residential property were to be developed concurrently."

"The state took responsibility for development of the program for industrial-commercial property and the state in conjunction with Maricopa and Pima counties contracted with CBM, Inc. to develop the computer program for use with revaluation of residential properties.

"CBM completed part of the system development in good shape in mid-December, but the state didn't. Development of the program was just too big for the state to handle," he said.

Assessors Threaten

At times most of Arizona's 14 county assessors, acting in loose association, threatened to disregard the state's decision to use the computer-determined values for residential properties for this year since commercial-industrial properties will not be on the system until next year.

Since the more up-to-date computer valuations are generally 25% higher than the assessor's previous values, partial implementation will force homeowners to shoulder an unfair share of the tax burden for this year, Foster explained.

Controversy erupted in spite of the consensus among the county assessors that the full system would take an enormous load off their backs. The computers will handle both the updating of field-collected data and the calculation of the property valuations, Arlo Woolery, director of the state Department of Property Valuation, noted.

The state has constructed a centralized computer facility devoted to handling just the property tax system.

Director of the system's data processing operations, Tom Chapell, said that communications terminals will tie 11 of the state's 14 counties which have no computer operations into the central Univac 9400 with a 131K processor.

"County assessors will be sending in updating information and we'll be running the operations in a batch mode," Chapell noted.

"The computerized approach CBM developed does result in greater equity within the class," Foster said, calling the marketing assessment program a really remarkable job.

In developing the assessing model for residential properties CBM randomly selected a sample of recently sold houses and analyzed the sales to find those characteristics which truly influenced market value.

For instance, living space was found to account for 63% of the actual sale value. Another 14 characteristics were also found significant, a big reduction from the 60-odd items assessors formerly used.

"What the computer does is to search the current real estate sales file the state maintains and take homes in the same general neighborhood with the same characteristics and uses the sales to estimate the value of unsold homes," said Woolery.

"The computerized approach is really management by exception," emphasized Dr. John Cook of CBM. "The computer can handle the 85% to 90% of the homes on which there is enough sales data and highlight the others with a deviation analysis. The assessors can then concentrate their limited manpower on the exceptions, applying a market-oriented cost approach."

"The residential computer valuations have run," Cook emphasized, and claimed, "The valuations are 50% more accurate and cost 50% less."

Univac 1106 can produce an engineering drawing in about five minutes for flight data assembly.

Computer Drawing Data Assemblies For Mars Rocket

SYOSSET, N.Y. – A computer designing complex electronic systems has furnished the drawings for a flight data assembly to be used on the Viking spacecraft to Mars.

The Algorex Data Corp. Aide (Automated, Integrated Design and Engineering) system uses a Univac 1106 to produce in five minutes an engineering drawing which would consume 20 to 40 man hours.

In operation, the basic logic design and physical requirements are stored in the computer memory, which also contains a list of all components to be used, with their physical and electronic characteristics.

The computer analyzes the logic and controls a plotter which produces the actual physical designs for placing and interconnecting components, automatically providing assembly drawings.

Chilean Brothers Are Watching

PARIS – *Zero un Informatique*, a French DP weekly, has published two photographs of the "control room" in Santiago, Chile, of a real-time government and factory management information system [CW, Feb 28]. The photographs were reportedly supplied by Stafford Beer, the system's designer, for exclusive use by that newspaper.

The first photograph shows seven chairs, each having a control panel connected to the "Datafeed" CRT system; and the screen (8 feet by 4 feet) on which can be projected schematic economic models. Two smaller screens display the results of calculations which permit a 10-year projection.

The second picture shows the "Datafeed" system, dominated by a large index screen. Below the index screen are three smaller screens, each equipped with five projectors, each capable of displaying 80 diapositives, resulting in the capability of choosing three projections out of a possible 1,200.

The system uses an IBM 360/50 and a Burroughs 3500. Data is entered daily by factories all over the country via special Telex and microwave links to the center, and filtering systems select only what is considered important information.

Rex Malik, *Zero un Informatique's* London correspondent, writes: " . . . it is exactly there that lies the interest of the system: indeed, it is important that this is not a 'depository' for out-of-date data, and that the Chilean leaders are not submerged by a wave of redundant information. In short, the system . . . furnishes that [data] which is truly significant."

What's in a Name?

MIAMI, Fla. – For those who want to be noncommittal, a computer will choose a company name completely devoid of meaning to provide flexibility in future broadening of operations.

Family Finance Corp., which operates 440 consumer finance offices in 26 states and 101 retail furniture stores in five southeastern states, is asking shareholders to approve a name change to "Aristar Inc.," chosen by computer. A spokesman indicated the present name "caused some confusion about the business activities of the company."

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Study Shows Car Flow Halved

Want to Cut Traffic? Carpooling Promises No Fooling

By Joseph Hanlon
Special to Computerworld

WASHINGTON, D.C. – Carpooling for employees of large firms is best done by computer and the results of successful carpooling schemes can halve the number of cars being driven to work, according to the Federal Highway Administration (FHWA).

In a report issued early this year, FHWA researcher Lew Pratsch gave guidelines for carpooling systems and discussed three successful computer programs.

If fewer than 300 people are involved, hand matching is best. For 300 to 5,000 people, Pratsch said, the best technique is a computer program based on a grid system laid down over an ordinary metropolitan map.

"Experience indicated that one square-mile areas are acceptable for gathering carpools in higher density regions while areas ranging to four or more square miles are acceptable in less developed regions."

The important criterion is that the carpool should not increase travel time by more than 25% over the fastest alternative, he said.

In the FHWA program, participants selected their own grid square from the map and filled out a simple form. The FHWA program then printed out a list of the names, addresses and telephone numbers of all persons in a particular grid square. When there were less than eight people in a square, the adjacent eight grid squares were also printed in the list.

The FHWA sent copies of each list to everyone on the list and let them set up their own carpools.

For Bigger Carpools

When the number of people participating in the carpooling scheme is more than 5,000, Pratsch suggested a system which automatically assigns people to zones, such as the Connecticut Department of Transportation (CDOT) system.

CDOT already had an automatic address coding system, and this was used in combination with a program to create variable size zones according to the amount of traffic generated.

This system also has the advantage that traffic analysis zones are not divided by major barriers, such as freeways, rivers and parks. Both CDOT and FHWA have used the programs with their own employees.

Saves the Air

The third system Pratsch described was developed by Burroughs Corp. and a local environmental group, Operation Oxygen, to reduce air pollution in Pasadena, Calif. According to Pratsch, the "program was well received by employees" and cut parking demand by 35%

Operation Oxygen is now distributing an "Industrial Package for Business and Industry" on carpooling that contains excerpts from both Burroughs and Xerox programs.

The report, "Carpool and Buspool Matching Guide," is published by the Public Transportation Branch, Urban Planning Division, FHWA, 20590.

Birthdate Seals Suspect's Fate

BOSTON – A routine investigation of a motor vehicle violation has led to the apprehension of a murder suspect – and all because a computer had this thing about birthdates.

Lamon E. Corvin, when being routinely investigated for a motor vehicle violation in Weston, Mass., became evasive and identified himself as Lee Carvin, according to state police.

When the information received was radioed into the State Police Law Enforcement Agencies Processing System (Leaps), the computer pointed out the birthdate supplied was that of a man named Corvin wanted on a murder warrant in Boston.

A computer printout at the Weston police barracks describing Corvin as a possible suspect caused the police to take the man to state police headquarters in Boston where fingerprints positively identified him as the murder suspect.

This Program Needs Bugs

LUBBOCK, Texas – Rather than debugging a program, a Texas Tech professor is trying to put bugs into his.

Dr. Ellis Huddleston is studying encephalitis-carrying mosquitoes as part of an international program to provide computer simulation of ecosystems.

Huddleston has acquired data on where the insects lay their eggs, the quantity and temperature of water required to support the larvae and mosquito mortality rates.

This data, he said, will tell how many mosquitoes there will be in September, and how much insecticide will be needed to control them.

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Editorial

The Industry, IBM and CW

We are sometimes asked, "Why are you so anti-IBM?" or "Why are you so down on the manufacturers, especially IBM?" Whether in conversations at conferences and trade shows, in letters to the editorial staff, or in complaints that come to us second-hand, there is much evidence that the *Computerworld* position needs restating.

We are not unhappy with DP suppliers in general, whether of hardware or software or maintenance or consultation, whether large or small, whether U.S. or foreign. We do have, however, a very definite and conscious bias: we are deeply concerned about individual users and the user community.

As anyone knows who has bought an automobile, a sirloin steak or some Swiss francs lately, there is a natural adversary relationship between buyer and seller. The former wants much for little, the latter hopes to supply little for much. In an ideal situation, good and even friendly accommodation is possible; nevertheless, there are always opposing forces. It is fatuous, misleading when a salesman tells his customer he has only that customer's interests at heart.

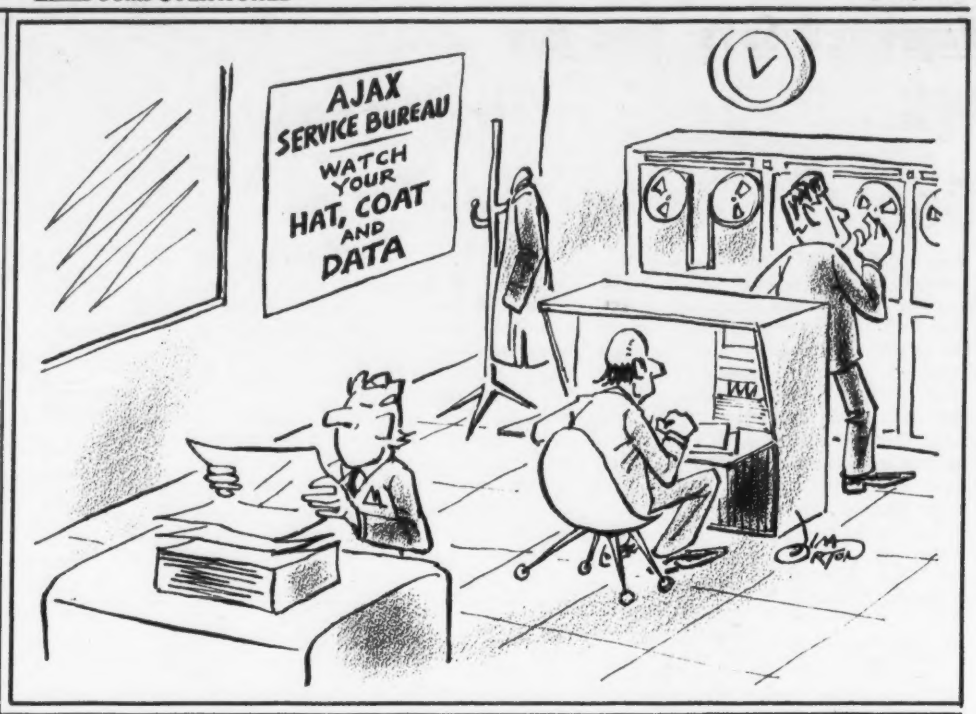
CW aspires to represent the user: aims to appeal to him. Our subscription list reflects this intention: 78% of our subscribers are users. Other publications, for example, *Electronic News,* represent the manufacturers.

We have applied, and will continue to apply, the touchstone of user community advantage in our news and editorial pages. When we see a product, a service, a supplier attitude, a professional society action that in our sometimes fallible judgment helps the user, we report it in detail and comment on it favorably. When we think we see something of less importance, or which could be demeaning to the user, we report it accordingly.

IBM is the giant of our industry. When it acts, we react; when it leads, we almost always must follow; when it delays or obfuscates or intentionally misinforms, we are more confused than when DEC or Siemens or Honeywell does so.

Inevitably, then, *CW* writers and editors watch IBM more closely, report its actions more frequently, criticize its practices more strictly than any other supplier.

This does not mean IBM is often careless or misleading or ugly, although like any other organization of human beings it sometimes is. What it means is that IBM policies and IBM people are enormously important to the computer user. We will continue to watch them attentively.



Letters to the Editor

'So Goes IBM, So Goes Economy'

Some years ago the Honorable Charles Wilson, then secretary of defense, allegedly said, "So goes General Motors, so goes the nation," or some similar words.

Whether *Computerworld* or I like it, the same statement can be applied to IBM and the country. In fact, to any large "blue chip" company and the country. Topple one of the industrial giants and the economy gets toppled.

Shallow-thinking people who write editorials and sarcastic viewpoints such as Neugent's "It's 1985 and IBM Concedes . . ." [CW, July 11], under the disguise of justice are not looking at the total picture which includes the economy of the country.

I am sure Judge David Edelstein will not be influenced by what either CW or I say – for that we should be thankful to the judge.

It is very doubtful there are many future computer-using organizations waiting for a decision to be handed down on the antitrust case before they purchase or rent a computer. Businessmen do not allow such intangibles to affect their decisions for the purchase of equipment that may adversely affect their profit.

A businessman's motives and objectives are geared to increased revenue and profit and not the speed of an antitrust lawsuit involving a computer manufacturer. The CW editorial of July 11 does not make for good reasoning.

Further, it should be remembered that a strong IBM makes for a strong electronics industry because it forces the others to compete against it. IBM equipment is more expensive, and as a result, most of its competitors have a price advantage which does not appear to help them. Why?

IBM performs, it instills confidence in a user – it makes him a believer. In fact, the antitrust suit is backwards; it should be the many IBM users who should be on trial and not IBM.

I am not an IBM user, but I am thrilled it is in the computer business.

Wesley T. Saville
President
RN-AAA Co., Inc.
Chicago, Ill.

Neugent's July 11 viewpoint was a personal one, and we welcome contrary opinions.

Indeed users do not want to delay procurement decisions. But these decisions certainly should involve not only cost, technical capability and maintenance quality but also the viability of the supplier. That viability, whether of IBM or another supplier, will be strongly affected by the outcome of the antitrust suit, and expeditious final settlement would, therefore, help the businessman. Ed.

Human Relations IBM's Weak Point

The article "IBM Hired Psychologist to Study Personnel Losses" [CW, May 30] was most interesting. After 11 years at IBM headquarters, I fully agree with the conclusions of the psychologist as presented in the article. If anything, he understates the situation. IBM's vaunted principle, "respect for the individual," is more honored in the breach than in observance. Perhaps one in 50 IBM managers does an adequate job in this area of human relations.

Thomas L. Gerber
Marketing Representative
IBM
Aberdeen, S.D.

More on Kronos

In the June 27 article on our Kronos-Scope benchmarks, there are several items which should be corrected.

- We benchmarked Kronos 2.0, not 2.1.
- The comment about Scope 3.3 vs. 3.4 performance differences not being significant concerned the response time at a terminal during the 8 terminal run.
- It should be mentioned that our Scope 3.3 has a locally modified scheduler, when comparing Scope 3.3 with the other systems.

James Haskett and Ann Bardin
Wrubel Computing Center
Indiana University
Bloomington, Ind.

(Other letters and viewpoints on Page 12)

Let's Fight to Make Current Languages Better

By Carlile D. Crutcher
Special to Computerworld

The numerous articles in *Computerworld* regarding who thinks which computer language is best are obviously generating substantial interest and following. I am glad to see this because I am convinced that we in the data processing community have a problem.

In our operation we have at least 30 and as many as 800 programs written in the following languages – 1401 SPS, 1401 Autocoder, 1410 Autocoder, Univac 1005 Assembler, Cobol D, ANS Cobol, RPG, RGP II, BAL, Fortran IV and Mohawk 2400 MDL.

Usually it is not possible to philosophize over which is the best language. All too frequently only one language can get the job done. It is this entrapment and lack of capabilities in existing languages that we find most frustrating.

What was routinely done in Autocoder by any number of programmers can't be handled in Cobol without all sorts of tricky exits; package programs written and maintained by IBM in Cobol D (its Palis system) can't be translated to ANS Cobol; results produced by a new Fortran system can't be input to an old reliable Autocoder system; and on and on.

Pulling back from our day-to-day problems in selecting the best language and assuming we really have a free choice, I have to admit we favor Cobol. We do not favor it for ease of coding, efficiency of operation or because of its great flexibility in a variety of situations.

We favor Cobol because changes and other maintenance can be handled more easily and routinely by individuals who have never seen the programs before. The extra money spent coding all that plain English in the beginning pays dividends over the long haul.

Cobol's Constraints

People have front-ended, back-ended and otherwise tried all sorts of expensive ways to enhance Cobol, but they always remain within the constraints set up for Cobol by committees and governing agencies somewhere. The academic community, I know, feels Cobol is beneath it.

I suspect many of EDP's most talented software experts feel there is nothing creative they can do in Cobol and are off touting and developing other languages. And yet here we sit, the great undefined majority having to take it on the ear, as it were, hearing about all the good things we can do in Algol, RPG II, PL/I and ALC when there seems no logical reason to me that these things can't be done in Cobol, too.

Rather than fight over who speaks the best language, I would prefer to see us fight for and support efforts to make the major languages better languages.

I would love to see control of languages taken away from warring committees and manufacturers with all sorts of vested interests and given to brilliant software houses who would have to produce better languages for us or go broke. We see this in other software – why not Cobol compilers?

Carlile D. Crutcher is at Capital Holding Corp., Louisville, Ky.

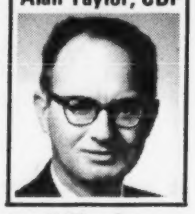
Honeywell Says: Bum Rap

Who Pays If a Proposal Doesn't Match Contract?

I recently called Honeywell Information Systems' public relations representative Norman Bryden and branch manager John Kells to get their side of a dispute now in process between a user and Honeywell.

After a series of long discussions, they told me I would be giving Honeywell a bum rap if I decided to give any publicity to the dispute, even though they did agree that Honeywell had proposed a turnkey system that was not delivered, and that Honeywell was not prepared to deliver.

The Taylor Report
By
Alan Taylor, CDP



But I don't believe its a bum rap – the whole subject of responsibility for proposals containing promises that computer manufacturers fail to live up to needs airing. So here goes the story – including Honeywell's position woven in at their request.

Meet Gerson Strassberg

The affair started last year in Flushing, N.Y. A small firm, Angler's Co. Ltd., was operating a small IBM Magnetic Card Ledger Accounting Machine, the 6400. It had been installed for over seven years, and after some initial trouble was handling the accounting side quite well.

Angler's president, Gerson Strassberg, had learned how to wire the equipment, and discovered it's limitations. Now, with his growing business the problems of inventory control were becoming serious. He wanted to obtain automatic and accurate inventory control of his small, stable line of plastic products.

Honeywell spent some weeks evaluating the position, and on Dec. 8 presented a proposal for a turnkey operation for all the systems. Programs described in the proposal included: General Ledger, Accounts Payable, Accounts Receivable, Payroll and Inventory Reporting, which were not specifically described but appear to be standard package programs; in addition Order Processing, Accounts Receivable Analysis and two special programs – Customer by County and Raw Materials Requirements – were specifically described.

Ten days later, on Dec. 18 Honeywell gave an Implementation Schedule showing that implementation of four systems (Order Entry, Invoicing, Accounts Receivable and Finished Goods Inventory) would be written and tested before June 15, while Payroll, Accounts Payable, Raw Materials Inventory and the General Ledger would be completed before January 1974. On the same day Angler's signed a contract for Model 58 machine service.

The Machine Service Contract

The contract included a clause saying that the contract constituted the whole of the agreement between the parties on the subject matter thereof – i.e., machine service of the Honeywell Model 58.

It also included a provision for a $2,000 payment for programming services, otherwise undefined, if Angler's did not convert to a five-year lease or purchase the system within a year after installation.

After legal review it was accepted by Honeywell.

On Jan. 4, two people, Bob Gilbert and Ron Boccard, were assigned to the account and instructed to complete "all preliminary fact gathering prior to Jan. 22, 1973." On April 30, Honeywell reported to Angler's that everything was on schedule. Honeywell also said that in order to make the July 1 date it was necessary to concentrate upon the programs that were to be ready at that time.

On May 22 Honeywell requested formal approval of a June 11 shipping date for the computer, and plans continued for live operation starting on July 1 (although no testing of the programs had been performed). Approval – subject to 48 hours notice – was given on May 25.

What followed was ironic. Strassberg, after approving the scheduling in of the hardware, wrote a letter to Honeywell about his experiences with the IBM 6400. "My experience with IBM in the installation of our former unit in 1966 was a sad one . . . primarily because the programmer engaged in implementing the system was sent to another city just before the system was to go live," he told Ronald Sahner, the new branch marketing manager, requesting that Bob Gilbert remain with the account "until all systems are operating and working smoothly." No reply to this is in the files – for about a quarter to five that very evening, Sahner heard the programmer concerned had given one week notice!

Angler's was again facing the loss of the programmer just before the new system was to go live, but this time it was at the programmer's volition, rather than at the hardware supplier's decision. In both cases it had been something that Angler's could not control.

On hearing of Gilbert's decision to leave, Sahner, knowing that Strassberg was packing for a European trip, went immediately to see him, even though the Memorial Day weekend had just started. Sahner assured Strassberg of Honeywell's intentions to bring in back-up support at once; and Strassberg referred to the Gilbert decision as being an "act of God."

Strassberg also agreed it would be possible to postpone the installation one month, if necessary.

The agreement to delay the live operation of the system from July 1 to Aug. 1 was documented in a letter written over that weekend by Strassberg in which he also said no further delay would be tolerable. In addition he withdrew his opinion that Honeywell was not responsible for any confusion caused by Gilbert's resignation. Strassberg asked for an immediate meeting on his return, June 11.

That Monday the meeting was held. Honeywell said it could not meet either the July 1 or the Aug. 1 dates for going live. It refused to accept responsibility for Gilbert's abrupt departure and claimed that the Order Entry system had grown to a size "that no one could have been able to predict at the onset of this project." Honeywell offered support and a "best estimate" dates for various parts of the program of between Aug. 15 and April 1 next year, an apparent slip of three months and a philosophy change from the turnkey operation style of working.

The next week a new branch manager, John Kells, came on the scene. He took the attitude that the contract was for machine service and that the proposal contents were not any part of Honeywell's agreement. Kells told Strassberg that Kells knew at least one Honeywell 58 programmer who Angler's could hire to write Angler's programs for them, and, according to Strassberg, Kells then offered to forgive rental on the system if Angler's would adopt this approach.

Kells also claimed he needed new information upon which to plan ahead, and scheduled five technical people to come down and examine the firm's requirements. This was in fact performed.

The atmosphere was not as good as it might have been, however, particularly as Kells himself failed to arrive as expected and could not be contacted by phone.

That Friday, Strassberg, still hoping he could obtain the hardware that he wanted, but no longer shielded by the Honeywell acceptance of turnkey responsibility, put what he had asked Kells for on Thursday – a firm schedule – into writing. Strassberg added he had no alternative but to consider obtaining other equipment. Strassberg gave this letter to one of the Honeywell men at the meeting, and requested an answer on Monday, June 25.

None was forthcoming. Neither Kells nor anyone speaking for him could be contacted when Angler's tried to do so.

Strassberg then wired four corporate officers – James Binger, Stepen Keating, Clancy Spangle and Robert P. Henderson – asking for an investigation, reporting that local management negotiations were impossible, and indicating he would have to consider suing for $1 million.

Robert Henderson's secretary sent the telegram to the regional vice-president, who found that a letter from Kells was in preparation and left matters at that. No one from any of the Honeywell corporate or divisional offices even acknowledged the receipt of the telegrams, nor was any attempt made to independently obtain any information from Angler's as to where the disagreement between themselves and the local management lay. (In fact, most or all of the officers were in London. On his return Clancy Spangle reviewed the Kells letter, agreed with it, and so informed Angler's on July 9.)

That is how matters now stand. As I say, I think it represents a type of bait (with a turnkey proposal) and switch (to a hardware services contract) operation which even if it is legal does not seem ethically proper to me. Honeywell tells me they believe they have done more than they are called upon to do, that they are still receptive to suggestions from Angler's, but not for any involved turnkey operations. Further, they think the visibility the matter is getting is really a bum rap.

I disagree – and I will give my reasons for disagreeing in a later column.

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...bait that caught the Angler

The following is a direct quote from the Honeywell proposal.

Honeywell Support Commitment at Angler's

Honeywell will install the following financial Management Systems at Angler's:

- **General Ledger**
- **Accounts Payable**
- **Accounts Receivable**
- **Payroll**
- **Inventory Reporting**

The description for each of the above systems will be provided to you.

In addition to the above, Honeywell will design, program and test the following systems especially for Angler's:

- **Order Processing:**
  - **Shipping Order Program – Shipping orders will be produced as well as a punched summary card; customer credit and inventory will be controlled.**
  - **Invoice Program – Invoices will be printed; cards punched during "shipping order" program will be read through the card reader. These cards will be mark-sensed by shipping department for order weight and modifications to original shipping order (because of out of stock, etc.). A/R will be updated and back orders will be captured.**
  - **Weight Variance by Order Program – Weights introduced by card during "invoice" program will be compared against computer order weights; all variances above a certain allowed tolerance will be reported.**
- **A/R Analysis System:**
  - **Customer/Invoice Payments Report – A special report, run on demand, to report customer number, invoice number, date shipped, payment date.**
  - **Past Due Report – A special report to print customers past due by time, dollars and salesman's territory.**
- **Special Programs:**
  - **Customer by County – A special program to report customer sales by county, comparing totals to known standards.**
  - **Raw Materials Requirements – A special system to control raw materials inventory; driven by daily orders.**

Honeywell will require that Angler's make available all information needed for the design and implementation of all systems and programs described above. It is imperative that Angler's supply qualified personnel to compile all necessary data files and help produce initial input for file loading. This must be done in a reasonable time to insure the success of the project.

TURN-KEY PROGRAMMING COSTS

		COST
Education:	**A complete data processing education will be made available to the personnel at Angler's. This will include system design, programming and operation.**	**No Charge $ 00.00**
Software:	**All packages described in this proposal will be provided to Angler's Co. free of charge.**	**No Charge $ 00.00**
Implementation:	**All systems and programs described in this proposal will be installed on a "turn-key" basis. Generous allowances have been made due to Honeywell's bundled policy. (see note)**	**No Charge $ 00.00**
	TOTAL	**$ 00.00**

NOTE: In the event that Angler's Co. does not convert to a five year contract or to a purchase within one year, Angler's Co. will agree to pay Honeywell $2,000.00 for programming services for the systems described.

When the ACM Council Meets... Study in 'Efficiency'

By Joseph T. Rigo
Special to Computerworld

Most of ACM's top officers and ACM Council members are marvelous persons individually. One or two may have lost contact with the world, but most are intelligent, hard working and conscientious about their responsibilities.

Still, something strange happens to them when they assemble for a formal council (governing legislature) meeting.

Council members are the association's elected officers, its elected regional representatives and members at large and the heads of key ACM functions. They number about 30 in all and meet two or three times a year, usually in conjunction with a major convention. The public can attend as observers, and I have now done this twice.

The council meetings take place at the end of the convention. Various subordinate groups meet during the week. A three-hour council session Thursday night gives members background information about matters to be voted on. The main meeting takes place all day Friday.

Most of the council discussion concerns finances, bylaws, committee reports and relationships with other organizations. In neither of the two 10-hour meetings I attended were there more than 15 minutes' discussion of membership activities.

This is not entirely accidental. Most of the membership action in ACM is under

Viewpoint

the jurisdiction of two boards. There is the members and chapters board headed by Alex Hoffman and the SIG/SIC board headed by Peter Denning. (A SIG is a special interest group; a SIC is a special interest committee.)

Hoffman is not a member of the council, and he did not attend either the Anaheim or the New York council meetings. He was in New York for some of the subordinate meetings earlier in the week, but left before the council session.

Denning attended both meetings but kept a low profile. At the June session, for example, he referred the council to his written report and spoke for only a minute or two. For the rest of the meeting, he appeared to be avoiding any word or action that would attract the council's attention to his area.

Denning even passed up an opportunity to gripe about the $80,000 in SIG money that national ACM has more or less impounded. The money belongs to the SIG members, but the national organization feels it may be needed to help keep the association's scholarly publications alive.

The chapters handle their own finances and won't let national ACM get near their money.

Money Talks

Council members talk a great deal about money. In particular, they are concerned about ACM's share of profits from the National Computer Conferences. They also worry about getting more corporate sponsorships and individual members. And they discuss how to save money by cutting back membership services.

Except for the scholarly publications. According to its current accounting system, ACM would actually lose money if it discontinued one of its magazines. (It takes a while to explain this one, so I won't try it here.)

Several council members are preoccupied with their own personal projects. ACM provides them with letterhead stationery and, frequently, funds. They attend council meetings to make cursory reports on their progress, vote and give statesman-like advice to the board and committee chairmen.

Some of the others just sit there – staring at their organizational navels . . . voting when called upon . . . taking no initiatives . . . never saying a word about data processing.

They all seem to be intimidated by the whole thing. Business must be transacted. No matter if it is of no value to anyone. The agenda is long and debate must be brief.

Herb Grosch makes an outrageous suggestion. Eric Weiss patiently explains why the suggestion is ridiculous. There are a couple of jokes. And the meeting goes on.

Smith Dorsey, head of the convention site selection committee, proposes Houston for ACM's 1976 meeting. Roger Mills wants to know why Albuquerque wasn't selected. Dorsey says he explained all the considerations in his written report. Carl Hammer says 1976 would be a great year to meet in Washington.

On to Houston

There is discussion of Albuquerque and Washington. Dorsey paces quietly. He has been through this many times. Finally there is a vote, and Houston is overwhelmingly approved.

Council members know they talk too much. They know that second guessing the board and committee chairmen is a bad thing. They know they are useless. So they sit and do what they are told. The meeting moves on.

Tony Ralston presides. He is president of ACM and keeps reminding the council the agenda is long and time is short.

Ralston works for a university. He doesn't believe that people who work for corporations know how to write. Except checks.

At a meeting earlier in the week, Ray Dash, head of the committee of chapters, said he would be proud to see ACM publish some of the articles that appear in *Datamation*. Ralston said he didn't want to see ACM's magazines filled with articles about Autocoder applications.

The council meeting ends at 5:30. The professional development program is eliminated. The lectureship program (speaker's bureau) for chapters is seriously cut back. Student dues are increased by $3. The annual fee for university institutional membership is increased by $50.

Council members hurry off to their cars and the airports. They had finished their work a half hour ahead of schedule. They had been very efficient.

Letters to the Editor

With or Without a Period?

Regarding Norman H. Friedman's letter [CW, June 13]:

Friedman states: "The name of our firm is U.S. Datacorp, spelled and punctuated exactly that way." Yet, when he signs his letter, he lists his firm with the presence of a period, i.e., U.S. Datacorp..

Ray Thomas
Jackson, Miss.

It was a typing and proofreading error on our part. Ed.

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Random Notes

Use of Variable Records, Tables Eased on 'DYL-260'

VAN NUYS, Calif. – DYL-260, a report composing and writing package from Dylakor Computer Systems Inc. has been enhanced to include an indexing feature that allows address modification for table loading and retrieval, or variable record handling.

Editing commands, total counters and formula results from the report writing section of the system can now be used in the data manipulation section.

This allows selective use of editing and comparing of results of computations before printing. Dylakor is at 16625 Saticoy St., 91406.

McDonnell Douglas Adds Program For Machine Part Analysis

ST. LOUIS – The Danuta program for finite element analysis can be accessed from either low-speed or high-speed terminals on the McDonnell Douglas Automation remote-computing network. Developed by Allis-Chalmers, Danuta is used for static and dynamic stress analysis of machine components.

The program can be used for simulating turbine blades, pressure vessels and complicated mechanical components.

Arched dams, shear walls and massive concrete structures can also be analyzed by Danuta. The network can be reached through P.O. Box 516, 63166.

Utility Network Adds CDC 6400

DALLAS – The facilities of the Utility Network of America, Inc. (UNA) have been extended to include a CDC 6400 located in Santa Barbara, Calif. This new center will support Cope terminal and remote batch operations for subscribers in the western U.S., a UNA spokesman noted.

The company continues its operations on another CDC 6400 in Washington, D.C., and a Univac 1108 in Chicago so that it now provides service across the country and into Canada. UNA is based at Suite 830, 7540 LBJ Freeway, 75240.

Mailing Lists Geared to User

GREENWICH, Conn. – Mailing lists, labels or personalized letters geared to carefully defined segments of a mass audience are all possible through the services of Compilers Inc.

Files the company has compiled include presidents and other executives of half-million to million-dollar companies, marketing, management and purchasing executives of companies that advertise nationally, members of boards of directors, and executives of companies in the metalworking industries.

Compilers Inc. is at 41 W. Putnam Ave., 06830.

Good Programmers Gain Most

Interactive Cobol Works, Study Shows

By Don Leavitt
Of the CW Staff

PALO ALTO, Calif. – Interactive development of Cobol programs is certainly practical and can provide extensive benefits to programming departments without increasing the total cost of their services, according to a recent study by Quantum Science Corp.

But, as with so many capabilities, the report continued, it is the good programmers who reap the most benefits and the poor ones who give this type of development facility a bad name.

Quantum, a DP market research firm, noted several manufacturers including DEC and IBM support interactive Cobol development, as do a number of remote computing vendors "such as National CSS, Interactive Data Corp., Com-Share and Tymshare."

The report focuses on those facilities that support entry of Cobol source code through an interactive terminal, with syntax checking of each statement as entered.

In addition, Cobol compilation is initiated and diagnostics are provided in an interactive mode. Perhaps most important, the facilities typically include interactive debugging capabilities.

In developing individual programs, the improvement through use of interactive rather than batch methods can be "startling," the report said, and improvement is much greater for the smaller, simpler programs or modules, than for the larger more complex ones.

"This appears to be a key argument" for the use of modular programming in interactive Cobol development, Quantum noted.

Overall, the company said, about a 50% reduction in program development time can be expected through interactive techniques. Debugging still takes a good deal of time but a large department can expect an overall increase of productivity of about 25%, and considerably higher improvements may be obtained in smaller departments.

Interactive program development is "extremely well received" by the programmer, apparently because to a large extent it gets him away from the long, hard hours traditionally needed during the testing and debugging installation phases of new systems.

By using interactive techniques, Quantum explained, problem areas can be "blitzed" when required, very much more efficiently than in a batch mode. This gave management and the programming staff a great deal of confidence in their capability to get the job finished properly and on time.

Potential loss of control is a major problem in using interactive Cobol development tools.

"It is very easy," the report noted, "for a programmer to use up time worth hundreds of dollars without much result unless fairly tight controls are established."

These controls include not only awareness of time being used, but means of preventing the loss of test files and programs in the interactive environment. This can be much more damaging than in a batch mode, because there is less time to recover, the report added.

The firm is at 851 Welch Road, 94303.

Business Modeling, Reporting Separated Under OLS 'Oracle'

PITTSBURGH – Financial managers can now turn to the Oracle for advice. Oracle is a planning, forecasting and analysis system recently installed on the On-Line Systems remote computing network.

Developed to aid both the financial model builder and the user, Oracle includes a model building language, model running facilities, a report generator language and support for both sensitivity analysis ("what if . . . ?") and statistical analysis and forecasting.

The model building language is described as "quite powerful" and similar to Basic in programming ease. It has a range of arithmetic capabilities including exponential and log functions, absolute values, square root, maximum, minimum and rounding functions.

Conditional Logic Supported

The language also supports conditional logic and financial functions such as handling of losses, carryforwards, depreciations and amortization. It provides facilities for both forward and backward iterations of the model. Forward iterations, the company explained, solve the type of problem that asks: "If my markup is X%, what will my earnings be in Y years?"

Backward iterations cover the questions: "What percent increase in sales do I need to have profits of X dollars in so many years?"

The statistical library available through Oracle includes regression and other analysis techniques, sampling and development of correlations, curve fitting and seasonal adjustment facilities primarily for use with time series data.

Separation of model building and report functions is one of the key elements in Oracle, On-Line spokesmen noted, since the two operations logically are independent of one another.

On-Line Systems is currently opening new offices and as a result Oracle and the network's other offerings are now available nationwide through dial-up connections to the new or established branches.

The company is based at 115 Evergreen Heights Drive, 15229.

Software Supports Health Units

BURBANK, Calif. – Hospitals and other organizations or data centers that serve the health care industry can acquire as much of an accounting system as they need from the Occidental Division of ECS.

Modules for medical billing and insurance forms, payroll, vendor and provider accounts payable, and general ledger and financial reporting can be used separately or as parts of an integrated system. Each module runs on a 65K configuration, the company noted.

The payroll module handles varied pay and deduction patterns, generation of paychecks, registers, personnel summaries and quarterly and annual tax reports, all varied as required by the special needs of health care organizations.

User-defined profiles can be inserted to allow different processing patterns during a single execution of the program. The medical billing module is a profile-driven accounts receivable system designed to accommodate fee-for-service and prepaid transactions with a complete collection subsystem. It supports variable data entry and collection, maintains family master files and generates patient master indexes, ledger cards, and weekly or monthly statements.

The module also produces insurance forms for Medicare, MediCal or private plans, and creates a number of management reports for the billing organization's internal management.

The accounts payable module is a control and check-writing system with a claim-payment and provider accounting subsystem.

It produces vendor master reports, a purchase journal and credit check list, as well as generating checks, check register, and reporting later on outstanding and canceled checks. Expense journals are produced at the department, division or organization level.

All modules are written in ANS Cobol and have been implemented on 360/370 gear, but could be adapted to other equipment as well. Price ranges from $960 (for payroll), to $12,600 (for medical billing). The General Ledger module costs $12,500 and the accounts payable, $6,500, from the firm at 805 S. San Fernando Road, 91505.

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A Non-Abrasive System

Prime Shift Devoted to Development Work, Testing

WORCESTER, Mass. – Some corporations have already developed complete plans for DP performance measurement, evaluation and enhancement but others have only begun to take steps in that direction. Typical of those that appear to follow a pragmatic approach is Norton Co., a manufacturer of grinding wheels and other abrasives.

The company's DP operations are centered around a 370/155 acquired in June 1971 and equipped with 1.5M bytes of core and 16 spindles of 3330 disk space.

The base configuration also includes a 3705 front-end communications processor which controls, according to the manager of system software, Chris O'Neal, 10 synchronous and 32 asynchronous data lines to 75 terminals and lesser DP operations very nearly around the world.

There are three systems programmers in addition to O'Neal on the corporate level system software staff, and nine people plus a manager on the hardware support staff. The system utilizes both IMS and Hasp system software from IBM.

Nearly Independent

Each of the RJE sites that feed into the Worcester center controls its own work, both for development and execution. The main center does require, however, that all Cobol programs be run through the Capex Optimizer after compilation.

The results of this decision have been very successful, O'Neal said, noting that the statistics captured by the Optimizer itself show an average savings of 26% of the core originally required by the programs.

This optimization can be used to run more programs in the same amount of core, or to extend buffers so that the programs will be less dependent on I/O and therefore – hopefully – faster in execution. Norton follows the second technique, extending buffers when possible to handle nearly full 3330 tracks.

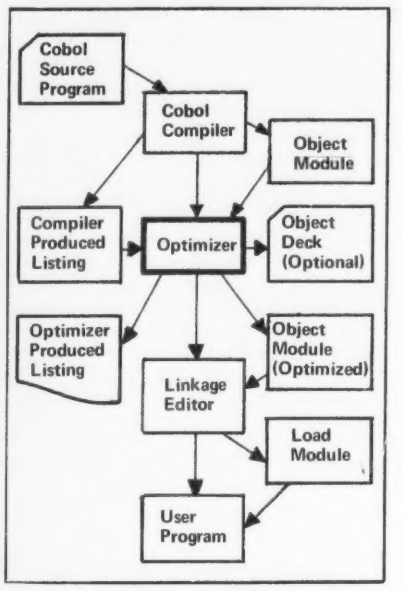
Execution speed is important, O'Neal explained, because Norton sets aside the first shift at the corporate data center for program development, testing and checkout of programs that failed during production. The second and third shifts are used to run production work, he said.

By the time work has been put on a production basis, it should be working pretty much on its own, but the development and test operations are the ones that need people to babysit with problems as they arise, O'Neal added.

The company looked at a couple of project control packages and has used them occasionally, but has never seriously considered a scheduling system as such. Each site is free to send in its work as it is ready throughout the two production shifts. There has not even been any attempt to set up blocks of time for each using RJE station.

With Norton's configuration, the firm hasn't found any real problem in allowing the outlying units to utilize the machine whenever they want. There have been times when different locations have come head-to-head contending for the same resources, O'Neal admitted, "but there have always been ways around the problem."

With a growing workload, this head-to-head contention may cause some real problems by the end of the year, he continued, but he doubts that even then they'll be serious. When they start showing up, Norton will still have time to solve them, he felt.



Optimizing adds a step to the compilation process but pays off at Norton, a spokesman said.

Norton really isn't just sitting back waiting for trouble.

The company has already been using IBM's Systems Measurement Instrument (SMI), a monitoring device, and the OS/PT-1 software to study what goes on within the hardware.

"SMI has shown us some interesting things about our channel usage and other devices," O'Neal noted, but OS/PT1 "didn't work out that well," and it didn't really give the company anything solid in the way of evaluation help.

The work with SMI ended in June and gave Norton a good picture of its hardware usage. O'Neal feels he now knows which packs are busy and he is aware that one channel in particular is extremely busy.

"We have some areas we can look at more closely, but for my own curiosity, it's not conclusive enough," he said. He added that the company is beginning to look at other support tools, including the Boole & Babbage configuration and problem program analyzers, and the Dynaprobe hardware monitor from Comress.

O'Neal characterized the 155 as a "fairly good machine" but indicated that even from the beginning Norton had tried to keep its options open: the company bought the CPU but leases the core from IBM.

This means the system can grow or – as the company had originally hoped – the core could be replaced with monolithic memory once IBM announced that.

He said his "no better than average" grade for the 155 was apparently shared by other users as well, for the topic of hardware failures on the 155 has come up in several Guide meetings. Ultimately the company may move to a 158, he thought, or it might just wait for the 375s that appear to be just a couple of years from announcement.

In the meanwhile, "we're hanging in there" with the 155, he concluded.

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Disk memory equipment. This was our second area of concentration. In a remarkably short time, we have become the leading independent supplier.

Tape systems. We've recently begun to concentrate on tape. The result is that our new 1040 Tape Drive combines the features of others with our own experience. We intend to be a leader in this field.

The point is we have not grown by accident. Thirteen years after our beginning, we have become a leader in computer peripherals.

For information on peripheral products, call your local CalComp office, or contact California Computer Products, Inc., CW-N7-73, 2411 West La Palma Avenue, Anaheim, California 92801. (714) 821-2011.

CALCOMP

Data Briefs

'Horizons Unlimited' Set For TCA Conference Theme

SAN DIEGO, Calif. – The TeleCommunications Association will hold its annual meeting Sept. 25-28 at the Town & Country Hotel in San Diego.

Under its theme of "Telecommunications-Horizons Unlimited" the conference will include workshops dealing with terminal selection, network design, telecommunications cost control, international communications and related subjects.

Keynote speaker for the meeting will be Dr. Wernher von Braun. An exhibition will include more than 100 displays of telecommunications services and products.

Information about the conference is available from C.H. Buxton, Box 2869, Anaheim, Calif., 92804.

Singer Offers Model 30 ASR

CARLSTADT, N.J. – International Teleprinter Corp., a Singer subsidiary, is offering an ASR version of its Model 30 teleprinter terminal.

The ASR unit allows preparation of standard paper, mylar or metalized mylar tape from keyboard or line input. The tape transmits to line or printer at 30 char./sec.

As with the RO and KSR versions, the ASR unit will be offered in both 80 and 132 print column configurations.

The ASR terminal will cost between $2,200 and $3,000 depending on quantity and options. Deliveries will begin in the fourth quarter of the year from 493 Washington Ave., 07072.

Plantronics Adds Teleprinter Buffer

SANTA CLARA, Calif. – Plantronics' Model 1300A electronic storage unit can serve as a teleprinter buffer, as temporary data storage, or as part of a line concentrator system where a central concentrator terminal polls each buffer periodically for readout.

The unit receives incoming 5-, 6-, 7- or 8-level serial data at any transmission rate between 37.5 and 2,400 bit/sec and converts it to parallel form. When appropriate, the unit changes the characters back into serial form and transmits them.

The basic 1300A costs $1,595 with immediate delivery from 385 Reed St., 95050.

Prices of DAA Couplers Cut 18%

WATERFORD, Pa. – Elgin Electronics, Inc. has reduced the prices on some of its data access arrangement couplers by approximately 18%. The price reductions are effective March 15, 1973.

New unit prices for the EDC-1000A, EDC-1001A and EDC-1001B are now $80, $150 and $115, respectively.

A complete price list including quantity discounts is available from the firm at Walnut St., 16441.

On Intrastate Services

N.C. Proposes Halt to Interconnection

By Ronald A. Frank
Of the CW Staff

RALEIGH, N.C. – The North Carolina Utilities Commission has issued a proposed rule that would prohibit the interconnection of customer-provided communications equipment beginning Nov. 1, 1973.

If the proposed regulation takes effect, phone companies providing intrastate facilities within North Carolina could provide service to users only through "equipment installed, owned and serviced by the telephone company."

Previously installed non-carrier equipment would be allowed "to remain in service" so long as the customer accepts "full responsibility for service and maintenance . . . and for protection of the telephone lines from said equipment."

The proposed regulation will be subject to a hearing procedure and the Utilities Commission will have to consider the opinions from interested parties before the proposed restrictions can take effect. But the proceedings will have one important difference from other regulatory attempts to limit interconnection.

The North Carolina proposal shifts the burden of proof onto the user, and presumably the supplier of non-carrier equipment, to prove that the customer-provided units are not harming the existing statewide phone network. In other cases the phone companies had to prove that harm was being done.

It will be up to supporters of interconnection "to establish that said interconnection of subscriber-provided equipment . . . will not adversely affect the quality of service or the economy of service of the basic telephone network to the general body of telephone subscribers."

Intrastate Facilities

The proposed rules restricting non-carrier equipment would apply only to intrastate facilities since the Utilities Commission has no power to regulate interstate communications. The notice proposing the Nov. 1 cut-off date was issued in June after an investigation was initiated early this year.

The investigation included a "data questionnaire" requiring that all phone companies under the control of the commission present their views on the impact of customer-provided equipment.

About 20 phone companies including the Bell System's Southern Bell Telephone and Telegraph, General Telephone of the Southeast and a large group of independent telephone carriers presented their views to the commission.

Based on these responses, the Utilities Commission issued the proposed rules stating that it was "of utmost importance" that the telephone system "not be jeopardized by further increases in the interconnection of subscriber-owned equipment."

Adequate facts will have to be established to determine the exact conditions under which interconnection should be allowed so that "the basic telephone network is not adversely affected by further and continued use of customer-provided equipment," the commission said.

Relatively New?

Citing that customer-provided equipment is "relatively new," the commission said the phone companies do not have "sufficient experience to know the quality of service and maintenance which might be expected on such equipment after it has been in service for the first half of its life expectancy."

The commission further said it should not wait for an increase in customer-provided equipment before taking the necessary steps to protect the network for general subscribers.

Although primarily aimed at PBX-type equipment, the proposed rule will probably also be applied to modems and other data communications equipment. The official notice contained a description of "non-communication equipment" such as "certain data and computer terminals" for which there may be a continuing public need.

Interested parties who wish to be heard on the proposed commission rules must file written Petitions to Intervene by Aug. 1, 1973. A public hearing has been set for Oct. 2, 1973. The Utilities Commission address is Box 991, 27602.

Package for IBM 3705 Users Provides NCP-Type Features

MANHATTAN BEACH, Calif. – Comm-Pro Associates has announced a Network Facilities Package for IBM 3705 users. Designed for use with the 3705 emulator program, the new software is said to provide network control functions without requiring the use of IBM's Vtam/NCP.

The package supports a flexible technique for communications lines to contend for assignment to 360/370 unit addresses. In addition, the terminal user is able to select which interactive system of the host CPU such as TSO, APL, or ATS, is required.

A single line interface can be connected to each interactive system; and, depending on the system select character that is entered, the terminal user will be connected to the desired system.

System 360/370 subchannel addresses are grouped into pools according to the system that will control them. After dial-in, the terminal user can enter a character that identifies a specific subchannel pool.

In the event that no suitable subchannel address is available, the 370 will generate a status message to notify the operator of the reason.

As an example, a terminal user would receive the message "APL is not up," if he were to dial in before the system was activated in the host mainframe. Both "system down" and "system busy" messages can also be generated by the 3705.

The first message is sent if no subchannel in the selected pool is active. The second message is generated when all subchannels in a pool have been assigned.

With the Network Facilities Package any start/stop terminal regardless of transmission speed may use any start/stop line interface to access the 360/370 through the 3705.

One of the biggest single savings would be the ability to use a single telephone rotary dial group to support multiple host teleprocessing-oriented systems, with different terminal types, the company said.

All interactive terminals including 2741s, TTYs and equivalent CRTs are supported, the company said.

The Network Facilities Package modifies the IBM 3705 emulator program without requiring any change to the 360/370 software. About "30 bytes" in the original emulator are changed, the company said.

The package is available on a 30-day free trial and the company will provide continuing support in case any IBM software changes affect the Comm-Pro software.

The Network Facilities Package is compatible with earlier automatic speed select and code conversion software offered by the company for the 3705 emulator program. The new package costs $3,500 from 638 14th St., Suite 700, 90266.

Datec Revisited

NEW YORK – AT&T has modified its position regarding its Datec field support program [CW, July 4].

To clarify "my misunderstanding of a question," Marvin Zollner, operations supervisor at AT&T said, "our policies and procedures regarding trouble reporting and technical escalation have not changed.

"Datec is a field support program and as such can only be requested by local field representatives and not by users."

Zollner had originally suggested that data users could directly request technical assistance from the Datec troubleshooting groups within AT&T.

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New Regulatory Battleground?

Specialized Carriers Geared for Intrastate Tariffs

By Ronald A. Frank
Of the CW Staff

NEW YORK – The specialized common carriers may soon face another regulatory challenge – this time from the states instead of the Federal Communications Commission.

With many of the new carriers set to begin operations, the difference between providing service within a single state and providing facilities between differing states becomes very real.

The distinction between interstate and intrastate services has long been a fact of life for the existing carriers. Almost all have filed interstate tariffs with the FCC and intrastate tariffs with state regulatory commissions.

But few specialized carriers have thus far sought authorizations to operate within state boundaries. One of the first attempts was filed in Oklahoma by United Video Inc. in June. The specialized carrier which plans to provide data and other communications services has asked the Oklahoma Corporation Commission for a "certificate of convenience" to supply intrastate microwave facilities. The request would cover service between the "corporate limits" of Tulsa and Oklahoma City.

One firm that objected to the United

Analysis

Video application is Datran, another specialized carrier that plans to operate in Texas. But the Datran objection is based on the claim that all specialized carriers, and not just United Video, should qualify for intrastate authorization within Oklahoma.

Datran opposed any certificate of authority to United Video if it excluded Datran from rendering similar services. It said that "competition in data transmission service is currently in the public interest." A hearing on the petitions of both companies will be held on September 25 by the state corporation commission.

Some observers believe the states could well become another "battleground" for the specialized carriers. One spokesman for a specialized carrier predicted that intrastate tariff applications included the potential for "many years of regulatory delay." But an officer of another specialized carrier expressed doubts. With the solid support of the FCC for the specialized carriers coupled with the demand for service on the part of prospective customers, he said it would be difficult for the states to resist the trend toward competition.

Others are not so positive. One source pointed out that many of the Bell operating companies charge higher rates along intrastate routes than they do for interstate service. And the local phone companies would not want to give up these areas without a fight, he added.

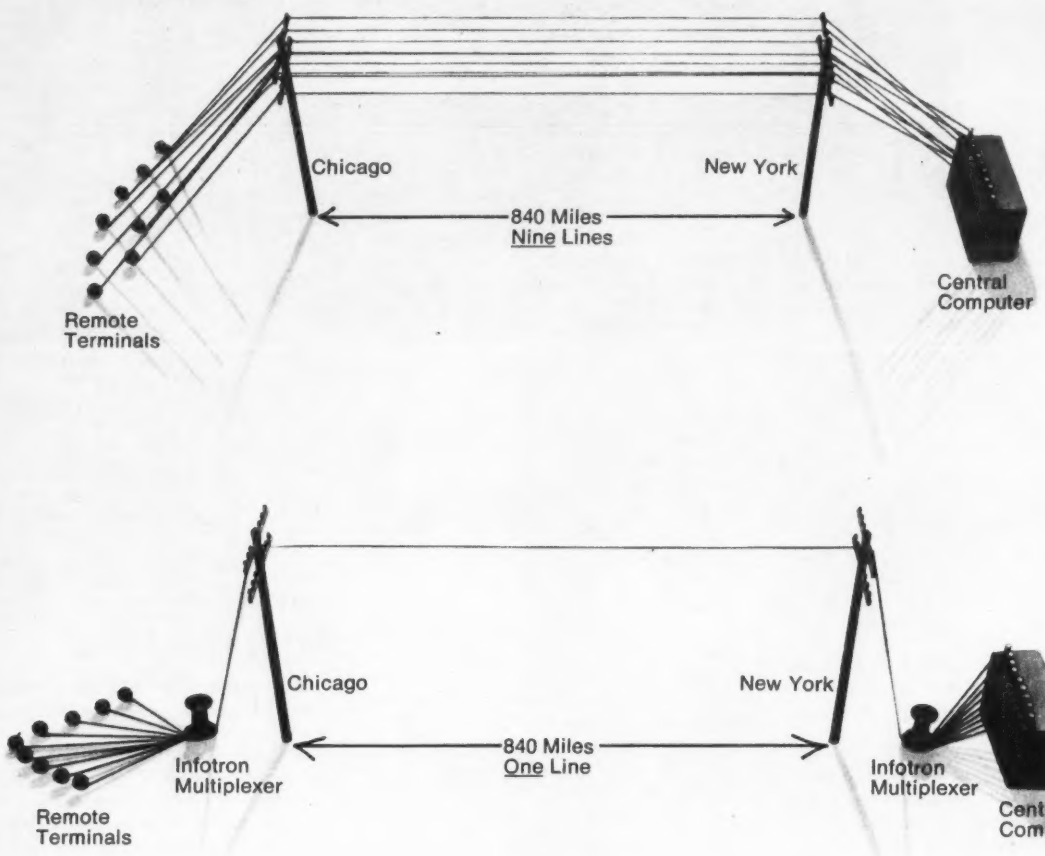
Few of the carriers are ready to reveal their intrastate plans. But N-Triple-C said it had scheduled a filing in certain parts of Texas for August. In that state there is no overall regulatory agency and each town regulates itself. This could help carriers planning to operate between Dallas and Houston, but no one is sure.

California Next?

One of the most promising areas for specialized carrier intrastate customers is in California. The new carriers expect to serve many customers operating between San Francisco and the cities of Los Angeles and/or San Diego.

If any of the state applications get bogged down in regulatory battles, the specialized carriers may use the "rusty switch" approach which is often applied by telephone customers.

With this regulatory ploy, a user will configure a network with at least one unnecessary or "rusty" switch point located across a state line. By moving the network into a second state, the user often can comply with the requirements for less costly and more liberal interstate rates.



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Reference Guide Adds New Carriers

RAMSEY, N.J. – The *Guide to Communications Services* has been expanded to include information on the new specialized common carriers.

The guide includes rates filed by MCI, N-Triple-C and Western Telecommunications. Other specialized carrier rates for private line services will be added as they are announced, according to the Center for Communications Management Inc., which publishes the guide.

The pocket-sized publication contains reference data including tariffed charges covering more than 40 telecommunications services available to users. Monthly updates are provided for an annual subscription fee of $47.75. The center's address is Box 324, 07446.

Ann Arbor Adds Ascii, Alphanumeric Controllers

ANN ARBOR, Mich. – Ann Arbor Terminals' Series RO200D serial display controllers provide alphanumeric data display from serial data sources. The units can also be used for direct readout from cassette recorders, OCRs and other serial data peripherals.

RS232-compatible, the Series RO200D operates with Ascii-coded serial data at asynchronous rates up to 9,600 bit/sec. The units have full cursor control and a built-in MOS dynamic shift register memory which stores a full screen of data. Display set is 64 alphanumeric Ascii characters. Formats are available up to 80 characters by 24 lines.

The controller's memory address register stores the data and positions the cursor. Eight cursor command characters operate on the memory address register to effect the cursor's movement. Each entry overwrites the character previously at that position without affecting other data.

Output in composite video is compatible with EIA standard 525-line video monitors. A TV output option enables the controller to drive ordinary TV sets.

RO200D models are delivered plug-compatible with the user's equipment, according to the firm. Prices range from $860 to $1,140, depending on display format.

Delivery is 15 days from 6107 Jackson Road, 48103.

Disk, CPU, Terminal Costs Cut

User Moves Inquiries Off-Line and Saves All Over

By Michael Weinstein
Of the CW Staff

MORTON GROVE, Ill. – When an on-line inquiry application kept expanding to the point where a major expansion of the disk subsystem would be needed to keep the system operational, Dennis Stewart, DP manager for Crane Packing Co. changed the output devices to COM units and not only avoided the upgrade but actually reduced both the system's disk requirements and overall costs.

The system that was becoming saturated was built around an IBM 360/40 with 256K bytes of core memory. This central processor was supported by a disk subsystem comprised of eight 2314-type drives for a total on-line storage capacity of 224M bytes.

Also included were 15 on-line video displays.

General applications performed by the system ranged from standard business operations (general ledger, accounts receivable, order entry) to on-line operations dealing with production control and inventory.

A typical application for the on-line terminal system involved personnel in the production line using their terminals to check on the availability of parts or shipping schedules. Later, other applications put on-line included production control routines and stock status reports, Stewart said.

In early 1973, the data base required by the 15 video terminals had reached the point where it required the dedicated use of two of the 2314-type disk drives.

At the expected rate of growth, Stewart said, he would soon need to add an additional disk drive – raising the system's total to nine disk drives. Since the disk controller is only capable of supporting eight drives, the addition of the ninth drive would have meant the added expense of another controller, he said.

"And further, even if we could have gotten the drive and controller for free the combination of an ever increasing data base and a projected increase in the number of remote video terminals was degrading overall system performance," Stewart said.

"With the eight drive configuration and 15 terminals, response time had degraded to about 20 seconds per inquiry," he said.

Another factor cited by Stewart was that the move to the larger terminal community would have required a better software support package. The current package (IBM Lotus) would have been inadequate for future enlargements.

In addition, the on-line system depended on the central processor always being up, but if some way were found to take the information off-line but keep the turnaround rate acceptable, this dependence could be overcome.

Come to COM

The most obvious avenue of investigation was COM (computer output microfilm), Stewart said.

As a first testing of the COM alternative, Stewart went to a local service bureau to see if COM really was a viable alternative and secondly, to see if it was possible to use the service bureau and not bring equipment in-house.

This test convinced Stewart that COM was viable, but the service bureau was unacceptable as the turnaround times were too long.

"Some output runs (to produce the tapes needed by the COM device to produce final fiche) were completed as late as 6 a.m. It was impossible for the service bureau to respond with finalized fiche by the start of the next working day," he said.

"At this point we accepted COM but began to investigate in-house units with the first recommendation being a Pertec unit similar to that used by the service bureau. But we decided against this as it required a dark room and all sorts of chemicals and we did not want to get into the film development business," he said.

Another decision made at this time, was to use fiche instead of roll film as there was fear that the more complicated nature of film viewers with their electric motors made them more susceptible to problems as compared to standard fiche viewers.

The machine finally chosen was a Quantor 105 which would be serviced by NCR.

With the system in, a change was made from video terminals to fiche viewers at the outlying production facilities.

In operation, a tape made during the third shift is taken off-line to the COM unit for production of the fiche.

As fiche are developed, a Bruning duplicator is used to make copies for the various departments. The duplicator also allows a fiche master file to be maintained in the computer center. "We presently produce 10,000 images per night and all final reports are at the user's site before the start of the next working day," Stewart said.

"So instead of finding ourselves with the difficult problem of having to increase storage, with the COM unit we found ourselves in the position of having two extra disk drives to use in support of direct system operations. Further as the inquiry operation was off-line we found we freed up a 96K byte foreground portion of memory that had been used 105 hours/week to support terminal operations."

User Specifies CDC Mini's Architecture

MINNEAPOLIS, Minn. – The CDC System 17 with associated software and peripherals is designed to move the 1700 series back into the mainstream of the state-of-the-art, according to the firm.

Admitting that time and technology were passing the older 1700 models by, R.M. Price, president of CDC Systems and Services Co. said the new computer would soon become the only production model in the 1700 series with the firm phasing out production on other models.

The System 17 is a modular circuit board computer made up of a chassis into which up to 36 circuit boards are placed in user specified combinations.

It is the combination of circuit boards included that determines the nature of the resultant mainframe. Boards include memory modules, standard processor modules and peripheral controller modules, CDC said.

Peripheral	Purchase	Monthly Lease One-Year Basis
Teletypewriter	$ 1,600	$ 45
Conversational display	1,995	60
Card reader	6,000	170
Line printer	17,000	370
Cartridge disk subsystem	14,500	355
Magnetic tape subsystem	11,500	325

Purchase and Lease Price of Peripherals Used With System 17

The advantage to the user, according to the firm, is that it allows a machine to be configured for a specified task without having to include and thus pay for features not needed.

64K Words Possible

Main memory capacity is from 4K words (16-bit word) to 32K words, each 4K word contained on one circuit board. For users wanting more memory, an expansion enclosure is available that will hold additional memory boards to a total of 64K words of memory.

The semiconductor memory is available with cycle times of either 600 or 900 nsec. As the central processor effectively cycles at 600 nsec the user chooses the machine's speed through the choice of memory.

Standard features with the basic System 17 are hardware multiply and divide; 16 levels of programmable priority; vectored interrupt; direct storage access channel connections; seven special and general-purpose hardware registers; and seven-level memory addressing.

Software Compatible

The new system is software compatible with the existing 1700 minicomputers. This compatibility is inclusive of operating and language software including on-line multiprogramming and communications packages.

Language capabilities include a liberal supply of mathematical languages such as Fortran IV and a Basic version written more for numerical operations (as opposed to character string operations).

Because of this software orientation and machine design, the Sytem 17 will probably find most external competition from minicomputers in the PDP-11 or Data General Nova class.

In most cases, the CDC machine will be used as a part of total applications systems produced for specified industries such as petrochemical or medical. In this role CDC said it will use their developed application software using the System 17 as part of the total solution, although it is available to general-purpose users, the firm noted.

New Peripherals

In concert with the revamping of the 1700 line, a new line of peripherals stressing lower costs and new technologies was announced including a cartridge disk and magnetic tape subsystem, line printers, a desk-top reader and operator consoles.

The disk subsystem employs one fixed disk and one removable disk per unit with a storage capacity of either 2.2M or 4.4M word/drive (200 or 400 track/surface).

Data transfer rate is 2.5M bit/sec with average access time rated at 35 msec. One controller is capable of handling up to four drives.

The tape subsystem is available with 7- or 9-track transports moving at 37.5 in./sec. Densities are 556-, 800- or 1,600 bit/in. Up to four tape subsystems can be controlled from one controller.

Printers include 300 and 1,200 line/min models using 64 and 48 character sets, respectively.

The card reader operates at a speed of 300 card/min.

All controllers for peripherals come in the form of circuit boards, that are inserted into the mainframe as the user specifies. A channel adapter also allows connection of peripherals and controllers used with older 1700 minicomputers to be run on the System 17.

Purchase price of the basic System 17 is $13,500 for the 4K word, 900 nsec configuration. This minimum system leases for $330/mo on a one-year contract – excluding maintenance.

An expanded system with 32K words of memory, teletypewriter, card reader, printer, disk and tape subsystem costs $89,600 or a one-year lease price of $2,320/mo – excluding maintenance.

Peripheral prices are shown in the chart.

First shipment deliveries are scheduled for the fourth quarter of 1974.

Printer/Plotter Combination Interfaces With Small Systems

CUPERTINO, Calif. – Versatec has introduced three new electrostatic printers/plotters (Matrix LP-1616 printer, 1600 plotter and 1600A printer/plotter).

The LP-1616 printer utilizes a 16 by 16 dot matrix to produce a "Versatec Roman" font consisting of a 96 character set – containing both upper and lower case letters.

An optional character set with whole numbers and fractions as well as the standard Ascii set of symbols and ligatures is available.

The matrix printer interfaces directly with most computers and prints 100 char./line at a rate of 300 line/min. Unit price of the LP-1616 is $6,900.

The Matrix 1600 is a raster scan plotter designed for applications demanding greater resolution such as computer aided design of architectural drawings, IC and PC board layout, weather mapping, etc.

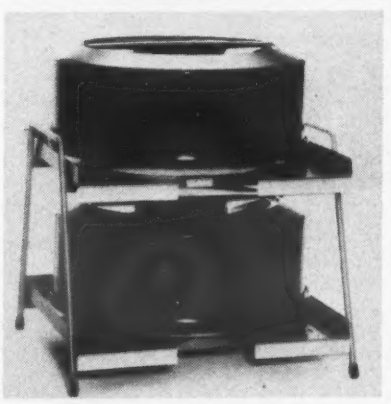
Plotting can be done in an area 10 in. wide by any length up to 500 ft at a price of $8,500.

The Matrix 1600A printer/plotter operates in three separate modes: printing, plotting and simultaneous print/plot.

The 1600A combines the plotting capabilities of the 1600 plotter with the printing ability of the LP-1616 printer. It prints 100 16 by 16 dot matrix characters across the page at 300 line/min from Ascii input data. Ascii input is decoded and converted to characters by means of a read-only memory included as part of a standard configuration.

Standard configuration includes a full 96 Ascii character set permitting upper and lower case printing at a unit price of $9,900.

Controllers for 29 computer systems are available from Versatec. Versplot, a software plotting package based on Fortran, is also available to assist in raster scan plotter applications. The firm is at 10100 Bubb Rd., 95014.



'Near at Hand'

Users can obtain a disk pack storage rack for holding two IBM 3336 or compatible disk packs on "dead" storage area atop standard drive units for $22.95 per rack from Winsted Corp., 2840 Grand Ave., Minneapolis, Minn. 55408.

Enforcer and Deterrent

Closed Circuit TV Viable Security for Large Firm

BURBANK, Calif. – Industrial espionage and employee sabotage are more than intriguing subplots for Hollywood films and television pilots. For a data processing center they are very realistic and often confounding problems which must be faced and effectively resolved.

At Tabulating Consultants, Inc., a 30,000 square foot data processing installation often open 24 hours, the solution took the form of a closed circuit television system.

Tab has security problems common to most computer organizations. It occupies a large area and is open long hours. Employees are mobile, and the firm is entrusted with millions of dollars worth of client files. Tab's clients, including an insurance company, a trade union and a mailing house, all demand and expect the company to keep tape records secure.

The closed circuit television system works, both as an enforcer and as a deterrent, the firm said. All entrances to the facility are posted with signs that read, "When you enter these premises it's with the acknowledgement that your presence and your activities thereon are being photographed and recorded permanently."

C.P. Mounce, Tab's secretary-treasurer and security officer, explained why he chose to let visitors and employees know they were being "watched."

"Our chief asset is our tape file and a slip-up there could be disastrous. Most of our tapes consist of 'fresh' names and addresses of U.S. residents who have shown their ability to buy and some special interest – either in a magazine, mail order merchandise or by shopping in a particular store.

Mounce emphasized that one client alone valued his tape files at $10 million and acknowledged that guarding and working with client files is an enormous responsibility. Tab has additional duties involving subscription fulfillment, typesetting, art work, advertising, accounting, billing collections and all correspondence for its clients. The operation is complex and the people involved should be monitored closely, he said.

With such a large installation, Tab ruled out the possibility of using security guards.

"If I put on three shifts of guards seven days a week," company President R.E. Kurzenknabe stated, "they would still have to go to the restroom, they'd still see good-looking girls walking by, they'd still get sick, they'd still have to go in and get a cup of coffee or have a cigarette.

"And there is no way I can afford to meet the payroll necessary to properly control these premises. If anything did happen, it would be a test of two witnesses, one against the other. But when I have it on that TV monitor, I can make a hard copy and prove beyond a shadow of a doubt that somebody was there who wasn't authorized. I don't think that there is any current medium that matches this as a security system, and it's very inexpensive for us. It's less than the cost of one guard's 40-hour-week salary," he said.

Tab began installing CCTV after consulting Seeburg Security, a local Panasonic dealer. Three CCTV and time lapse VTR cameras were employed to monitor the firm's three entrances. With viewing consoles in his office, Mounce was able to see the people entering the premises but could not always see those leaving.

The firm used the system for three months and was so pleased with its success that they had Seeburg enlarge and cover every entrance and exit. Four cameras were installed in the computer center to monitor not only the computer room but all the access areas and the tape library.

Smile, You're on . . .

From his office, Kurzenknabe can watch his secretary, accounting, the check vault and the overall facility. Mounce also has a set of monitors in his office, acting as a backup. In total, Tab utilizes 16 cameras, three VTRs and three sequential switches which enable the viewer to change viewing field, scan an area, or shoot a close-up and display the picture on the monitor of his choice.

For some clients, Tab maintains signature plates for payrolls which total millions of dollars. The plates are locked in a safe, and only four Tab officers have authorized access.

Another plus of the Panasonic systems, Mounce added, is the time-lapse videotape. Tapes are often kept for a long period of time before they are used, he said. In the event of a catastrophe during the waiting time, documented proof of what transpired must be obtained, so the time-lapse videotape takes one picture every 40 seconds.

For instance, Mounce was able to prove the exact time an earthquake hit his building by automatically filming a clock. Some of the earthquake footage was remarkable, he stated. There were scenes of a briefcase sitting upright on a desk in the computer room, shaking but never falling over; light fixtures falling and acoustical tiles dropping from the ceiling. All the while the audio portion of the tape carried the sounds of a building falling apart.

Sophisticated Workers

When asked if his employees minded being "watched" by a modern-day big brother, Kurzenknabe replied, "Our employees are sophisticated people. They understand the reasons behind the television system and it doesn't bother them. In fact, very often they appreciate the close supervision it affords.

Client response to the security measures has also been good, the president reported. The first thing the client sees when he enters the Tab office is three television monitors. In one monitor is a picture of the client himself. "Our customers are very pleased to know that Tab goes to this extent to ensure the safety of our records," Kurzenknabe said.

Mounce agrees and adds that the combination of visible cameras and posted warnings has had a major deterrent effect. Tab has yet to have anyone try anything dangerous.

"The idea is to stop a problem situation before it starts," Mounce concluded, "that's the most important thing. Secondly, if something should happen, we can report it, prove it and nail the guy that did it. The process should certainly give second thoughts to anyone contemplating an action in the future."

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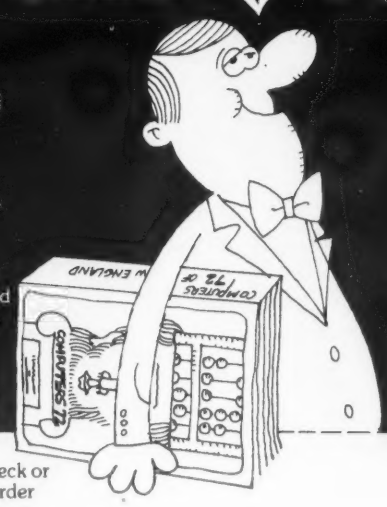

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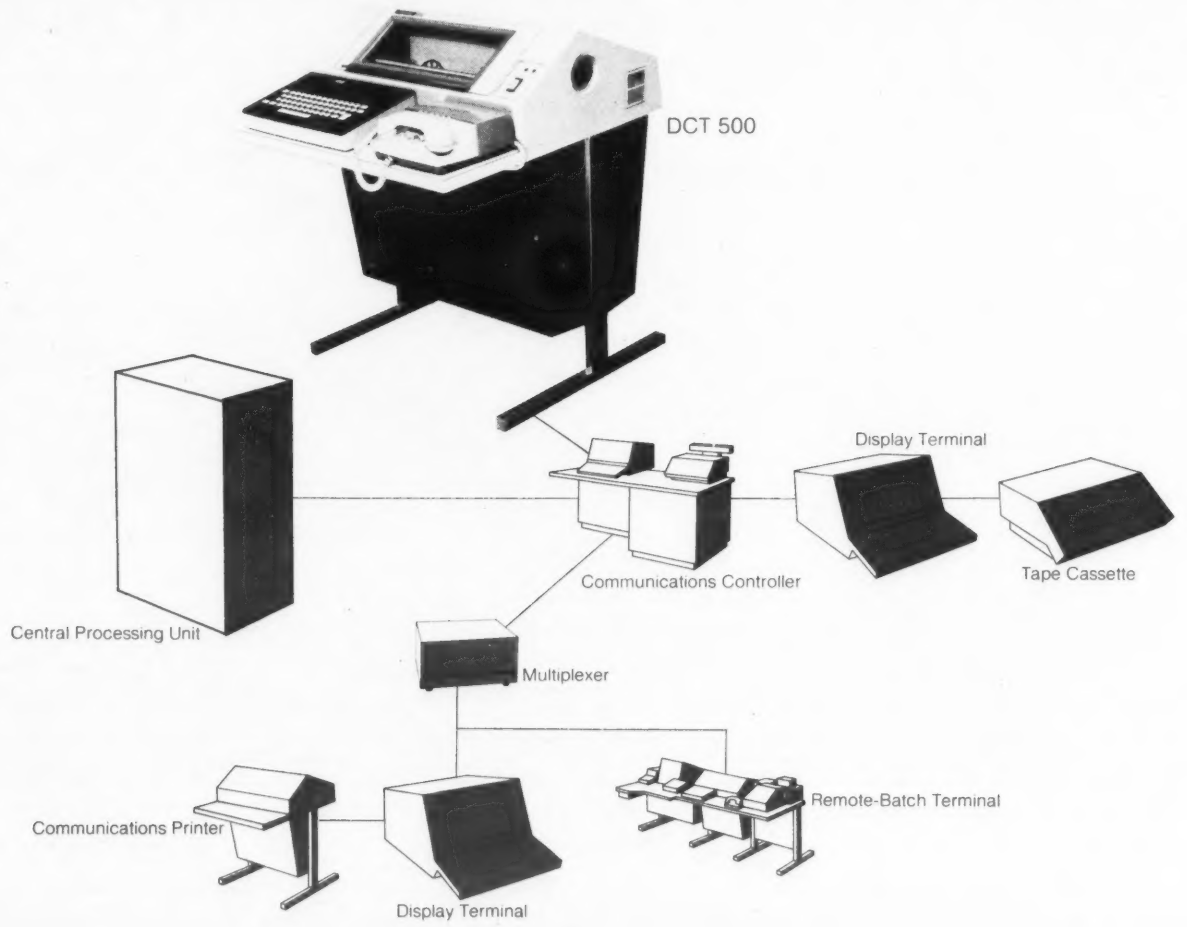

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COMPUTERWORLD

CW SPECIAL REPORT

★ Software Makes Hardware Happen ★

Data processing may save the world of business from its inefficiencies – as prophets forecast in the early 1960s – but what will save the world of DP from its inefficiencies? That's the question the realists of the 1970s are asking.

The answer appears to be a whole range of tools and techniques, all geared to systemizing DP support functions the same way DP itself imposed systemization on business functions.

This special report focuses on user experiences with these tools and techniques. Their trials and triumphs show what can be done by real people in real situations.

Software or Hardware Monitors? Results Depend on Effort, Planning, Personnel

CAMBRIDGE, Mass. – For a "modest" effort of computer performance evaluation (CPE), hardware monitoring techniques "normally yield more useful and analyzable data" than software techniques, according to the latest issue of the *Casebook* newsletter, written by ADL Systems Inc.

On the other hand, the publication continued, for an "extensive" CPE effort, software techniques will be more effective, though they will require greater analysis in order to reap the greater benefit.

The fact that ADL Systems devoted *Casebook* to CPE indicates the growing interest DP managers and corporate leadership have in trying to make computer installations more effective and efficient. But the rule-of-thumb conclusions noted above indicate just as clearly the problems these same managers face in trying to decide what tools to use.

Casebook doesn't define either "modest" or "extensive" efforts, but does give a capsule view of what the techniques are, what some of their reports look like and what results some users have had through their use.

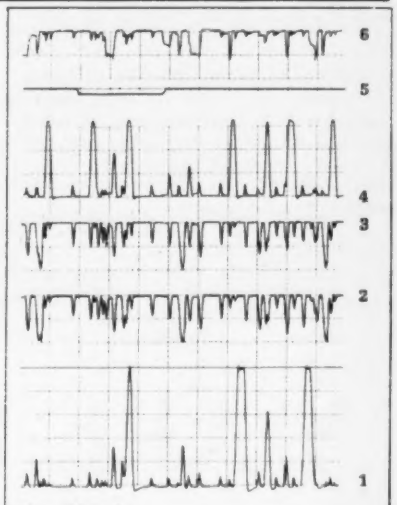
It noted that hardware monitors are analog devices attached at various points to a computer system so that signals, generally voltage readings, are recorded continuously on some sort of media. Recording these changes over time provides generally useful information for determing utilization rates of the systems's various components.

Software monitors work inside the system, as separate programs run concurrently with the application and operating system programs, interrupting them and sampling specific activities at specific intervals and, once again, recording the data for later analysis.

Tools are only one-third of the CPE function, *Casebook* added, since to be effective they have to be used according to a well thought-out plan, by trained people.

The plan must start with a written description of the apparent problem or the set of circumstances that suggest inefficient operation of the CPU and some hypothesis as to the cause of the problem, according to the newsletter. Some definition of what data should be collected and the intended use of that data in finding the cure should be in the plan.

The criterion for choosing either type of monitoring tool, or a combination of the two, is that the tools chosen must provide the data called for in the plan.



Key	Signal
1.	program interrupt key (scaled from 0 to 15)
2.	problem state
3.	wait state
4.	selector channel (with 2314 discs)
5.	time signal (1/25 of a second subdivision)
6.	multiplexor channel

A hardware monitor provided this recording of an IBM 360/50 operating under DOS for .28 seconds.

Finally, the newsletter urged, "apply your best analysts to the problem . . . They should understand the applications system, the operating system, the equipment in use and the interrelationships of them as well as be proficient in using the measurement tools."

Managers should anticipate allocating one to four man-weeks per problem under investigation. And larger organizations "might find it advisable" to set up on-going but loosely organized groups to define and measure computer equipment efficiency periodically, as problems and priorities change.

Casebook is distributed free to senior executives interested in computer systems and software development. ADL Systems is at Acorn Park, 02140.

Measurement Tools Perform for Users

User experience with performance measurement tools, reported in the ADL Systems *Casebook*, showed:

- **A merge of 200,000 records required two hours and there were plans to rewrite the program to use a second channel. Analysis of monitoring showed that actually the job was CPU-bound and further checking identified some particularly inefficient code. When corrected, the run time was reduced to 45 minutes.**
- **Through hardware monitoring, it was found that several jobs were interacting and queuing for access to the same channel. Reorganizing the data files led to 40% reduction in run time for the job stream.**
- **Software measurements were used in a history update run to cut CPU time 25% and elapsed time 30% by reducing the movement of data in work areas.**
- **Elapsed time for an inventory update run was reduced 60% by using software techniques to identify the potential benefit of using core indices for Isam files.**
- **The 90 minute elapsed time of a job was reduced to 20 minutes by using software techniques to identify the benefit of changing the blocking and buffering of a master file.**
- **Measurements of CPU and I/O activity on a small processor showed how to reschedule a job stream to bring about a 27% reduction in partition hours for a job stream – from 314 hours to 230.**

Bank Really Gets Most Out of DP Support Packages

BOSTON – It may be true – as articles in various journals have claimed – that the last jobs to be automated are the DP support functions themselves, but that is a generality that doesn't apply to the operations at the National Shawmut Bank.

The bank uses the Scheduler package from Value Computing, the Automated Tape Library Accounting System (Atlas) from GTE Data Systems, the Program Library Utility System (Plus) from Cullinane, and – occassionally – the Problem Program Evaluator (PPE) from Boole & Babbage.

International Systems' Project Analysis and Control (PAC-I) and IBM's ANS Cobol optimizer feature are also used, according to assistant vice-president Arthur Johnson, but Applied Data Research's Autoflow has been dropped since detailed flow charts have been abandoned as documentation tools.

"The Shawmut" currently has two 256K 370/145s and a smaller 360/40 operating under DOS, a CDC 915 optical scanning system, and – in the methods area – a DEC PDP-11 that was installed in May to support internal problem-solving work in a time-sharing environment.

Surrounding the basic IBM mainframes are some 24 tape units, nine printers, "disks of all kinds – 3330s, 2319s, 1411s," four Micr reader/sorts, and audio response units. The collection of peripherals is, for the most part, switchable from one CPU to another, Johnson said.

The Scheduler package allows Johnson's operations staff to plan each day's work, taking into account such things as peripherals being shifted from one system to another or last minute changes to deadlines or run times of programs due to be used. The package has been in at Shawmut for about a year, including a longer-than-expected implementation period as the scheduling data base was developed.

Though much of its work may seem repetitive, the bank actually copes with a "wild schedule" of mutual fund dividend runs, statement preparations for other banks and interest calculations that sometimes fit together nicely but, at other times, collide.

Scheduler doesn't do anything the staff couldn't do for itself, Johnson admitted, but it does it "a lot better than we could do it." The schedules it produces are sensitive to requests for specific jobs from the operator, but also provide much less chance of overlooking the routine things that must be done. It also takes into account predecessor relationships between parts of an application system and mandatory start or completion times.

The system also provides a way to "try out" different hardware configurations without a great deal of effort. After making quick changes in the configuration definition ("What happens if we drop eight tape drives?"), Johnson can have the Scheduler rerun to see if all jobs can still be handled.

At the end of the day the Scheduler

(Continued on Page 22)

On the Inside

In-House Staff Focuses on Design, Documentation

User Puts Programming Burden on Outside Companies

PHOENIX – Nearly three years ago, Valley National Bank decided to replace all its major application systems and at the same time abandon – once and for all – the "not invented here" syndrome. To get its new software the bank would go "outside" and, moreover, it would even let its own programming staff go.

The need for resystemization was triggered by a move from GE (now Honeywell) 415s to IBM 370/145s and a 135 under DOS, and initially involved only those applications that interfaced directly with the bank's customers. New systems – including on-line support to the bank's 100 branch offices – were also envisioned.

A series of in-house applications are still being run and maintained on the 415s, but these too are expected to go when the final resystemization to OS/VS on a 370/158 is undertaken later this fall.

The bank had several choices once the decision to go outside was made, assistant vice-president James Andrews admitted. It could have picked up a number of separate packages and some contract programming to get what it wanted.

'Super Package' Chosen

In fact it chose to acquire what in effect was a "super package" of many applications developed by Results Inc., a Dallas-based software house now part of University Computing Co. The package covers all the normal commercial bank applications, Andrews said, except installment loan accounting which is being acquired from Arthur S. Kranzley Co., Cherry Hill, N.J.

Taken together – as they will be under a Central Information File (CIF) system being written by UCC – the Results/UCC and Kranzley efforts make up about 95% of the work Valley wanted to get done on the rewrite.

Putting the programming burden on outside groups has been cost-effective, Andrews said, but it has also meant that his group – some 32 strong now – has been able to concentrate on other problems.

Seven of Andrews' staff are hardware specialists. Others were able to work closely with Results, to spell out just what the bank wanted without the nagging fear that, once the design was complete, they would have to program what they were asking for.

While telling the software house what was wanted, the staff was also able to devote seven man years, for example, to writing user-oriented documentation for the Demand Deposit Accounting (DDA) system. Others ran seminars in various bank locations so that all concerned would know how to use the system once it was ready.

The installation of the Results systems has not been as fast as some of the users would like "but those of us who have been in DP for awhile" haven't been surprised by the time it has taken, Andrews said. In some cases the delays have been even longer than he expected, the VP said, but "by and large it has timed out fairly well. The fact is we're getting a lot more than we can absorb in the immediate installation time frame."

A representative of the software house commented on the odd sensation the Valley job gave its staff, knowing that this client was putting all its trust in the skills of the Results staff. That's bound to give any real professional pause to think, he said.

Systems Group Takes Over

Once the new programs and systems are operational, they pass from Andrews' group to a system software and operations staff that also has some 30 members, according to staff member Gary Liscierelli. They have found several packages to be very useful in their maintenance work, he added, citing Pansophic Systems' Panvalet library system as one example.

By running all program source decks through Panvalet and posting them to a 3330 disk pack, the staff has been able to maintain a clear record of all updates and give management much better control over the source library than it had with card decks. It's also good for audit control, he added.

Panvalet is a big help in maintenance, since it includes a stored file of changes made in the past. Each is labeled so that complete versions of a program can be reconstructed. When a job is turned over to a programmer he can see what changes were made and when, Liscierelli continued.

Valley's support team also uses IBM's Ditto utility package, Dyl-250 from Dylakor Systems, and the Data Analyzer precompiler from Program Products Inc.

Bank Makes Good Use Of Support Packages

(Continued from Page 21)

produces recaps comparing actual experience with expected results. Its reports of resources used can become part of a charge-back billing system, Johnson noted.

Tape Library Controlled

The Atlas software is used to control the bank's 5,000-reel tape library which is spread out in three locations, Johnson continued. A manual system might work, he agreed, but the flexibility of being able to list the tapes by number, location, application or any other criteria has made it "very useful." He noted that reports of such things as which tapes needed cleaning simplified his work.

Cullinane's Plus has been used by the programming staff for about two years, he said, and has been interfaced with Atlas so the bank can trace back seven generations of most of its source programs. Plus provides "better documentation" on program development than the Shawmut had before.

Johnson said the bank uses Boole & Babbage's PPE occasionally, leasing it by the month when a review of expected programming activities shows a slow period coming up so that the staff will have time to clean up old code.

The Optimizer built into IBM's Cobol compiler does some good, Johnson said, but he wondered how much it really did. "When we went to ANS Cobol," he explained, "core usage generally went up. The optimizer seems to reduce core about as much as the move to ANS increased it." It looks to him as if "IBM gaveth with one hand, and tooketh away with the other."

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Be a 'Nice Guy' When Using CPE Monitor Techniques

DEARBORN, Mich. – The use of monitoring and all the other computer performance evaluation (CPE) tools has to be cushioned politically, so that the programmer and his manager do not feel threatened. "Try to let the user feel he has found and solved the problem," Al Cartier of Ford Motor Co.'s software planning staff said.

"Show the people how they can do the job, but in any case, be a nice guy when you're using these tools. Otherwise, you'll leave the guy you were trying to help with the feeling that he had really done a poor job before." The results of using CPE can be well worth any strain required in being a "nice guy," he added.

In one instance, he continued, after monitoring an installation that had two computers installed, one was sent back to the factory and the full workload was taken over by the remaining unit without problems. He sidestepped a question about what size CPUs were involved, explaining that it was irrelevant: if one computer can do the work of two, it's a waste of money to keep the extra device.

Many Mainframes

Ford has an immense collection of computers with major centers here in Dearborn, outside Detroit; in Toronto; Canada; and in London, England. The center here includes an ASP complex of "three or four" 370/165s, Cartier said, though he wasn't sure whether a 360/65 or a 370/155 that had been part of the complex had been upgraded yet. "In any case, it's irrelevant to the question of monitoring" he added.

Ford in fact has some 280 CPUs including many minis, and mainframes from IBM, Honeywell and Burroughs. Much, but not all of the software Cartier's group has acquired is IBM-oriented.

The company uses the Scert simulation package and the Dynaprobe and Dynapar hardware monitoring tools from Comress, as well as the Configuration Utilization Evaluator (CUE) and Problem Program Evaluator (PPE) from Boole & Babbage. Monitoring is a full time job for the six-man corporate staff, and every piece of computing equipment is supposed to get an annual review, Cartier said.

The company uses the Capex Optimizer at all the major DP centers but the DP directors and division managers served by the center determine to what extent the package is used.

Cartier said he was also responsible for Ford's acquisition of several other packages including Informatics' Mark IV file management system, Cambridge Computer Associates' Crosstabs for doing cross tabulations, and Autograf for financial report writing. Each of these tends to cut back on the effort the programmer has to spend in his work and therefore legitimately comes under the software planning group, he said.

Truth in Advertising

The Optimizer from Capex checks Cobol object code after a program has been compiled, and strips out any code that is deemed to be unnecessary for the particular program's logic. Cartier could not provide exact figures on how much core had been saved with this package but he said "it performed as advertised."

He noted that the IBM ANS Cobol compiler version 4 that Ford uses includes an optimizing feature, but analysts at Ford have recommended that it not be used. It does not do as good a job of optimizing as the Capex package, they told Cartier, and once a program has been through the IBM optimizer it can't be handled properly by Capex.

Boole & Babbage's PPE "isn't used an awful lot," he said, "but that may be because we depend so much on word-of-mouth acceptance of an available product." He explained that in some divisions where this casual "advertising" had gotten the word around, PPE was in fact used a lot. But where there was no one to say "try it, you'll like it," no one tried it.

Managing the Data Bases

Ford also has many of the data base management systems in use at one location or other. These include IBM's IMS, Cincom's Total, MRI's System 2000, Honeywell's Integrated Data Store (IDS) and a couple of Ford-written ones.

For all their shortcomings, data base managers are useful and the available ones certainly "beat having to write our own," which Ford did a number of years ago just because there were no alternatives.

Ford is also looking at teleprocessing monitors including Task/Master and Environ/I for use with the various data base management systems. Task/Master is already in use in Canada and Environ/I is often sold by Cincom in conjunction with Total.

With all the available tools, there are only six on the corporate staff for software planning. That size group is fine by Cartier

(Continued on Page S/4)

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New Approach to CPE

'Speedometer' Could Show Total System Performance

Interview With
Michael F. Morris

About five years ago a small group of computer simulation specialists was holding one of its periodic rap sessions on working problems. The question posed was, "How can we tell, in a reasonably short time, how well or how poorly an existing computer system is performing?"

This provoked much discussion but no real answer surfaced. I remarked that it was too bad computers didn't have speedometers. This and many subsequent sessions often degenerated into cute analogies involving things like "speed limits," "reckless driving," and so forth.

It became apparent that we didn't know enough about computers to describe a real analog to the simple concept of "miles per hour." Further, if we had a speedometer, we wouldn't know what a "safe" or "dangerous" speed was, or, for that matter, if speed really had anything to do with the goodness or badness of a computer's performance.

Nevertheless, we all agreed that something better than a "wait light" had to be possible for judging a computer's performance in real time.

Over the years the idea of some kind of speedometer-like display has been on my mind through many computer performance evaluation (CPE) projects.

Consider the value of a real speedometer on a car: in itself the speedometer tells almost nothing about the performance of any single part of a car. But all alone the speedometer does provide a real-time indicator of the total system that comprises the car and its responsiveness to the operator's demands.

Degradation of most parts of the car are ultimately reflected via the speedometer at levels varying from immediately obvious to slightly perceptible. For example, the speedometer dropping from 60 to zero in less than one second might describe total system degradation due, perhaps, to an encounter with a tree, while increasing from zero to 60 in something over 15 seconds might suggest partial degradation due to a need for new spark plugs. Of course some other observation or special-purpose instrument might be needed to find the specific cause for the change in performance, but the speedometer provides a real-time indication of the car's performance as a total system.

Why Not Computers?

Why can't computers have a dial like this? The reason is not at all clear. Perhaps the builders of computers don't think it's important for the user to know how well or how "fast" the system is operating. Maybe the users don't think it's important.

It could be a more basic problem like the lack of accepted units analogous to miles per hour for a car. Or a contributing factor may well be the vast difference in scales of time that computers and their operators operate within.

None of these is reason enough, however, to account for the almost total lack of instrumentation on modern computers. It seems to me that computers probably can have something like a speedometer.

Suppose a computer had seven standard dials – five fixed and two variable – all feeding into a master system dial. (See Figure) Suppose also the displays were generated so that 0 meant either as bad as possible or no activity at all, and 1 meant either good as possible or completely "saturated."

The dials need not have units in the physics sense and the displays should not be taken as rates but rather as "figures of merit" for the computer relative to the demands placed on the computer. Each dial would need an accumulator to hold currences of the activity to be displayed and a method of refreshing the display about once each second.

The display would probably also need some smoothing filter that would allow the dial to display the average of, say, the last three to five seconds of activity. This would slow the displays down to the point where a human could observe the major trends he might be capable of reacting to. It would also move the dials at rates that made optical sense rather than "buzzing" back and forth between 0 and 1.

Information displayed on these seven dials is proposed as follows.

Dial A – Work Factor: the number of applications program instructions executed divided by the total of all instructions executed (this is the inverse of what is usually called the degradation factor)

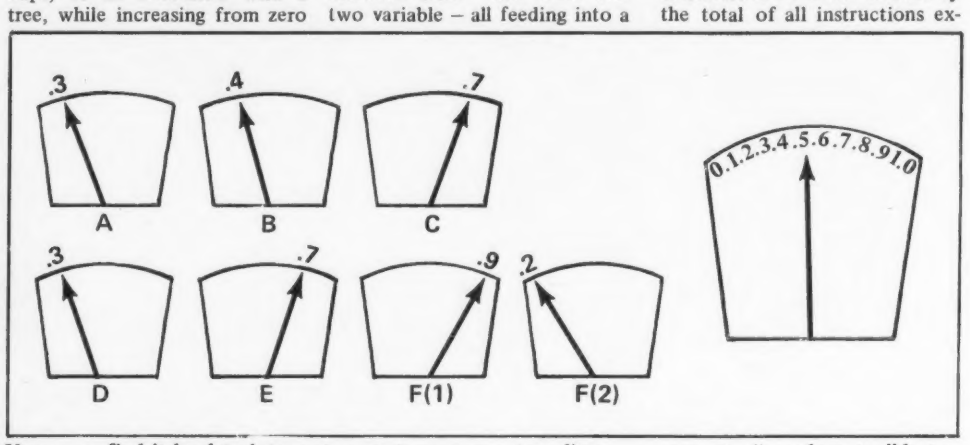
Dial B – Speed Factor: Elapsed time for all jobs minus total CPU busy time, divided by elapsed time for all jobs (the inverse of the term usually referred to as the delay factor)

Dial C – Multiprogram Factor: Number of jobs running concurrently divided by the number of jobs which can be run concurrently

Dial D – Memory Saturation: Memory in use divided by total usable memory

Dial E – CPU Saturation: CPU busy time divided by total elapsed time

(Continued on Page S/5)



Users may find it hard to interpret separate component readings on a computer "speedometer," but an average reading – shown on one meter – could be easily understood.

Be a 'Nice Guy' When Using CPE Tools

(Continued from Page S/3)

who believes strongly that they should try to help but not insist on helping users.

The corporate staff also handles training chores as well. Cartier, for example, has taught Crosstabs classes. Vendor representatives sometimes visit Ford, sometimes Ford employees go to vendor education centers. The staff has also gone to third parties, such as Boeing Computer Services, to teach subjects such as JCL.

The training is not strictly monitored, however, and up till now there has been no apparent penalty if a manager had to hold a man back from a class to which he had been assigned. Training has been a budget item for the corporate staff, but that will change next year.

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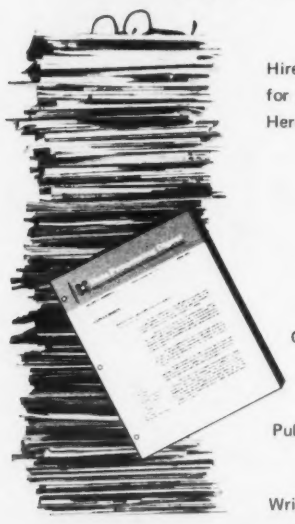

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But CPU Use Jumps

Tuned VS System, Job Mix Cut Processing Time 35%

NEW YORK – Many DP professionals have told the world what they think would happen if they moved their workloads to a virtual storage environment. And many have actually made the move with mixed results.

People at Mobil Oil moved to VS earlier this year, ran a carefully constructed test and saw processing time drop 35%, but they are still not really sure what the results mean, according to Lyell Rodieck, manager of computer technology.

Mobil had been using two 192K byte 360/40s, but moved up to a 384K 370/145 in an OS/MFT-Hasp environment. The new system has six spindles of 3330 disk on one channel, eight 3420 tapes on another, and a collection of slow-speed I/O on a third.

Job Stream Assembled

To set up the test, Rodieck said, they assembled from actual work a job stream that "seemed reasonable." It contained some Cobol, some Fortran, some linear programming, but "very little" Assembler. Files were primarily sequential but there was, she noted, a reasonable amount of Isam work as well.

In a "real" OS/MFT mode, this stream of 13 jobs ran 76 minutes with a CPU utilization, according to a hardware monitor, of 46%. With Hasp added, the job stream ran 69 minutes with 50% CPU utilization. That became the benchmark.

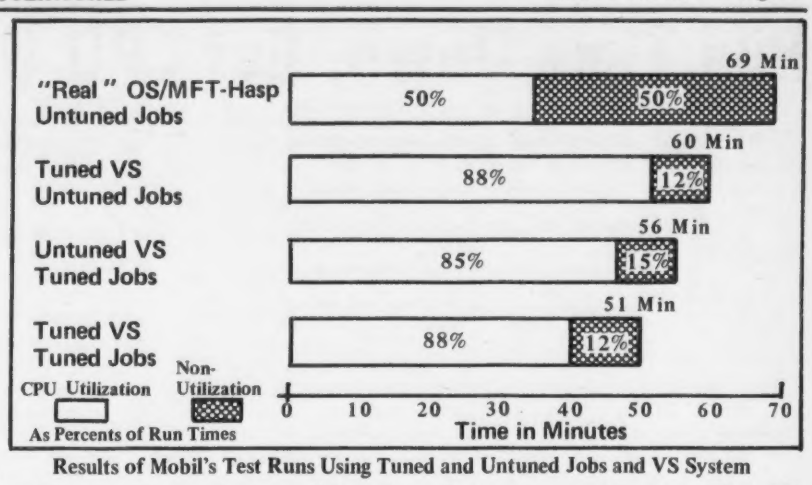
The systems group then began to look at the project from two separate though obviously related directions: tuning the operating system itself and working with the problem programs being run.

The system tuning team found it got the best advantage by locating the data sets more precisely and by altering the resident module list to control the amount of paging needed to keep the system going. Placing data sets on absolute addresses at cylinder boundaries provided the most gain, the team found.

Otherwise, Rodieck added, putting the Paged Data Set near the center of the pack and adjacent to VTOC, "and doing all the nuts-and-bolts things systems programmers do" also helped.

But the tuners didn't stop there. "Then we used IBM's Generalized Trace Facility to determine what access methods, SVC routines and Build lists we should include in the system. We put all of them in the pageable supervisor."

A new test with the original job stream running on the tuned system "showed some improvement," Rodieck continued. The run time went down to 60 minutes. At the same time, however, the CPU utilization went up to 88%, she said.



Results of Mobil's Test Runs Using Tuned and Untuned Jobs and VS System

Program Team Sharpens Focus

Meanwhile, the team working with the problem programs began to focus more and more on certain areas. They felt concern for block size and buffering, modular programming, sorts, compilers and linear programming codes would probably be the most beneficial.

They found – as expected – that high blocking factors yielded the best results. It would be ideal, according to their

(Continued on Page 26)

'Speedometer' Shows Total Performance

(Continued from Page 24)

Dial F(N) – Component N Saturation: Component N busy time divided by elapsed time. The two F dials should be selectable over any peripheral or class of peripherals.

The figure has been arbitrarily assigned activity levels for each subsystem dial to illustrate the generation of the system dial. The dial labeled system would serve as the computer's speedometer. The component dials might be thought of as subsystem speedometers.

For Operator's Use

These instruments would be for the use of computer operators. The trend of the system meter would become established over time as the operators became familiar with the relationship between work in progress and the activity level shown on the meter.

Reactions to the display would be in the form of introducing jobs of a known type or in rearranging work to better use the available resources. It would ultimately allow operators to categorize the working programs to perform real-time scheduling and rescheduling to take advantage of the equipment's capacity. Systems programmers might even find it an advantage to see the effect of their coding modifications on the operational system.

A further byproduct of this type of instrumentation would be in having many of the signals available in a single location that are needed for hardware monitoring.

But the real need is for something to help the operators know when they're doing a good job and when and how they could do better. In short, it would provide a real-time indicator of the total system comprised of the computer and its responsiveness to the operator's demands.

Morris is program development officer at the Federal ADP Simulation Center.

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Run Time Down, But CPU Use Jumps as VS, Jobs Tuned

(Continued from Page 25)

findings, to use full track blocking on any data set that was sequential. This meant 13K blocks with 3330 disks, however, and that would have been completely impossible on a "real" memory system because of space limitations.

Buffers of about 4K bytes seemed to be optimum for sequential tapes, the analyst continued, and the convention of two buffers per file "seemed to be about as good as anything."

In the next area of concern, Rodieck said some people felt modular programming would do very poorly, and monolithic programming very well under VS, "but we knew this wasn't true. There is an inherent inefficiency in modular programming, but this shouldn't really be affected by VS."

Generally, modular programming has the same ratio of executing inefficiency under VS as under a real environment. But Mobil found that by link-editing the most active modules together, run times could be improved markedly.

This happens, Rodieck explained, because any program spends most of its time in a subset of the whole, and this link-edit technique reduces the size of this "working set." By tying together the most active parts of the program, the user gets them in memory and pages out the least active – "which is just what you want to do."

Even though it is effectively impossible to know where pages will occur, there are advantages rather than disadvantages to using modular programming in a VS environment, she summed up.

Sorts are quite literal in the interpretation of user-provided parameters, and that can cause problems in VS, Rodieck went on. If a user tells the IBM Sort SM-1 that it has, for example, 256K bytes in which to function, it will adjust its algorithms to use 256K bytes optimally. If that space isn't really available – as is the case with VS in normal usage – the sort degrades badly.

To get best results under VS, she said, Mobil "told" the Sort it had just a little less space than it probably had in fact. This doesn't involve any particularly complex method, she continued. "If there are four jobs working in a 256K partition, each will have – on average – 64K bytes, so use that, or 50K, for the Sort parameter."

Linear programming codes seem to work very much like the Sort, she said. "They will try to use whatever memory the user says they have and degrade badly if it isn't there." In this case again the user should try to estimate realistically the average amount of memory that will really be available to the linear programming logic.

A test of the work done by the problem program tuners, run on the "plain old VS system that we started with" dropped the execution time to 56 minutes, and the CPU utilization to 85%.

Another test, bringing together both tuning efforts, caused the execution time of the 13 jobs to drop to 51 minutes, but the CPU utilization crept up to 88% again.

Mixed Feelings

All concerned at Mobil are pleased with the 35% reduction in processing time, but there are mixed feelings about the high CPU utilization. Some feel it means the company is running out of CPU power faster than it ever ran out before, with an upgrade in equipment also likely to occur faster.

Others argue that the high utilization, coupled with the functional advantages of the new operating system – hot partition, hot card reader, no need for repartitioning for different sized jobs – means the company is finally using all the computing power it is paying for.

It may be, they admitted, that the workload cannot be increased significantly if the work must be done at the same time as current work. But by getting work done faster, they said, the company has the potential of doing a great deal more work in the time that has been saved.

In any case, the company has decided – on the basis of the tests – to use VS as the operating environment on 145s in four of its data centers in Europe, Rodieck concluded.

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The situation

Every computer user must carry-out function tests on newly deveoped programs and systems to verify the correct functioning in a wide variety of cases. A test which is not comprehensive and thorough enough may lead to future production breakdowns, considerable inconveniences and expenditures. Such testing requires a set of testdata which reflects all the possible and impossible situations the program may have to cope with. Normally the manual creation of testdata, if at all complete, and properly documented consumes approx. 20% of the programmer's time as well as costs to transfer the data to a machine readable medium. Altogether time and costs that are often unexpectedly high. The manual procedure has many other disadvantages. Sometimes, live-data is not available for testing because the application itself is new and no production file is existing; or contains only normal data, in other cases the programmer would invent, write down and transfer the data himself which makes the reliability equal to the programmers' sophistication and ambition. Furthermore, it should be realised that testdata have a tendancy, volumewise to grow exponentially with every new variant added which does not encourage the programmer to create a comprehensive set.

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TDG-L

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Lack of Operational Involvement

Top Management Holding Back Performance Standards

By Jack Paden
Special to Computerworld

It has been said that nearly half the computers operated by U.S. businesses aren't paying their way. And the basic problem in this sorry situation is the continued reluctance of top executives to become involved with their computer operations.

Data processing people can do little about runaway computer costs because:

- There is little pressure (or reward) from top management to keep computer costs realistic. To the contrary, DP salaries normally are tied to the size of the installation: the more it costs, the higher the top salaries.
- Top management has no effective way to measure DP performance. It cannot conclusively say that its installation is in the top 50% or the bottom 50%. It is at the mercy of such outside opinion as it will allow in its offices. All too often this is the manufacturer (who, after all is said and done, really makes his living by selling hardware).

Missing Link

The missing link is comparative performance standards which are worthy of general business acceptance. Computer operations are a significant part of the cost of doing business, as well as a part of the capacity to do more business. Only top management is in a position to solve this problem.

Performance standards do not come easily, particularly with the new multiprogramming machines and their on-line, teleprocessing and data base capabilities. A good many DP people don't understand them.

Human performance (i.e., the people around the computer) is the really dominant factor affecting the costs of data processing. This becomes even more critical as the new hardware is more fully loaded.

The old serial machines had easily defined limits and there was a wealth of experience available with which to measure performance. Historical "rules of thumb" went back 40 years as the old punched card equipment had basically the same limits.

Unfortunately, an underloaded multiprogramming machine will look much the same as a serial computer. It's only as it becomes more and more loaded that the inadequacy of the old performance measurements becomes apparent.

It should, therefore, come as no surprise that more hardware is being sold now and being used less efficiently. This is true with the minicomputers as well as the larger computers. This situation is a natural outgrowth of inadequate standards of measurement and is also the reason why the development of performance standards should be a user's rather than a manufacturer's problem.

Scheduling Headaches

My experience with multiprogramming computers has shown that once 24 hours per day for seven days a week is scheduled, additional work loads rapidly accentuate control problems. Scheduling simply becomes too much for the operator to cope with at the console, especially when something has gone wrong and he is trying to recover. Furthermore, the sheer volume of getting input ready for the computer and output distributed demands extra hands.

Heavily loaded computer installations invariably have separate scheduling and control personnel because, without them, the computer can't be kept busy. Any computer that is not kept busy around the clock is not being used economically.

Realistically, a data base should be available during normal working hours through on-line terminals and the main DP working shift should be at night. The main shift should also be at night for computers processing only batch-type programs; but the day is not far away when batch updating will no longer be economical.

Throughput, as indicated by open unused machine capacity, can vary from not enough time to finish the work to a half-loaded machine for the same jobs, depending on the individual operator.

It is the effect on throughput of the operator, however, that is the most elusive to measure of all cost factors. Throughput, as indicated by open unused machine capacity, can vary from not enough time to finish the work to a half-loaded machine for the same jobs, depending on the individual operator.

Comparative Statistics

This is the reason our installation is beginning to identify all computer measurement reports by the individual operator who produced the work, rather than by the shift. Comparative performance among operators processing the same work can produce internal standards; however, we will not know whether our best operator is doing acceptable work compared to other installations. Some sort of average, or standard deviation of many observations on many similar installations, offers the promise of more trustworthy tools of comparison.

It is on this assumption that the performance study currently being conducted under the sponsorship of the Burroughs users group (Cube) [CW, July 11] is proceeding. Statistics are being gathered for the month of July. These will be grouped by similar hardware configurations which are operated under similar software and operator conditions.

The goal of this study is to begin to set some standards of measurement.

Until such standards are proven to be worthy of general acceptance, however, the most practical solution to throughput problems will probably remain, buying so much hardware that the human problems don't show up. This solution treats the symptom instead of the disease and is terribly expensive to apply with little hope for a cure.

Jack Paden is president of Paden Data Systems, Dallas, Texas.

About the Author

This special report was prepared by CW Software Editor Don Leavitt who has been responsible for the Software/Services and Education sections of the paper since March 1970.

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AMC Engineering Center Helps Provide Safe, Stylish Cars

DETROIT – American Motors (AMC) is solving complicated engineering problems, meeting safety vehicle standards and insuring compliance with exhaust emission requirements through use of a computer system designed specifically for scientific auto-related calculations.

The information gathering and analyzing equipment, which has been installed in a new engineering computer center at the company's corporate headquarters here, provides time-sharing and batch-computer services to the central engineering and styling staffs.

The initial data processing assignments carried out in the center pertain to vehicle safety and design, and were reflected in the development of AMC's 1973 passenger cars.

The system includes a Honeywell Information Systems' (HIS) 635 information processor with its own control unit and a capacity for 98K 36-bit words of main memory, an HIS Datanet communications processor that handles up to 120 time-sharing terminals, an HIS 316 minicomputer for data acquisition and control with the capability of converting analog signals to digital values, a Calcomp plotter, four magnetic tape drives, a card reader and a card punch, a printer, two operator control consoles and more than 95M characters of information stored on disks.

Frank Bitonti, engineering systems supervisor, shows Gerald C. Meyers, ACM group vice-president, product development, and John R. McGuigan, corporate director, information systems, how he monitors the data flow at the communications center console in the engineering computer center.

John F. Adamson, vice-president, engineering and research, said that AMC's new computer center significantly reduces the time required to evaluate results of safety tests and effectiveness of engine pollutant control devices, as well as drastically cuts down the design information cycles associated with mechanical and body styling developments.

When the system is fully implemented, not only will AMC's engineers and stylists have a computer sciences department, but American Motors' Kenosha and Milwaukee assembly plants, the proving ground laboratory near Burlington, Wisconsin, and Jeep operations in Toledo will also be able to tie into the Detroit computer center by means of remote terminals.

Material to be processed by the computer center includes barrier crash test data; safety and emission test analysis; suspension system analysis; spring, engine, body, gear and hinge mechanism design; braking and nose dive characteristics; wheel alignment; steering geometry; seating design; sound and vibration factors affecting noise levels; stress and strain analysis; and structural analysis.

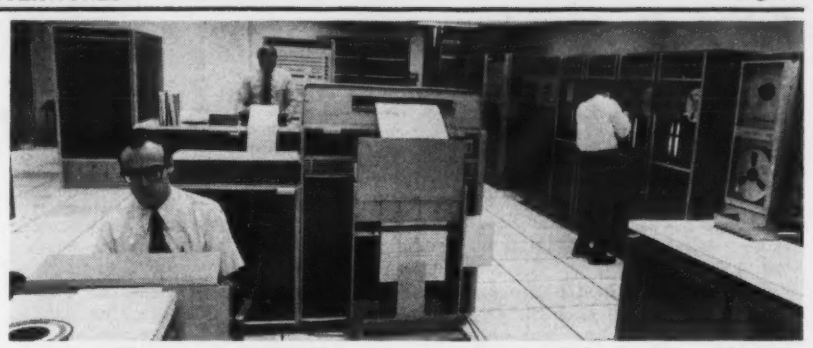
Fast Answers

"Faced with constantly changing vehicle design guidelines relevant to environmental and safety factors while striving to offer our customers products that are aesthetically pleasing," Adamson said, "AMC's engineers and stylists find they need answers to specific problems today – not in weeks or months as once was the case."

Adamson called attention to tests currently being conducted in AMC's safety laboratory in Detroit, where a high-speed sled is employed to simulate barrier crashes, as one of the projects the engineering computer is monitoring.

This test project, designed to evaluate passenger restraint systems in preparation for the more stringent 1974 federal safety standards, utilizes life-size dummies in a normal car body that is attached to a rocket-type sled riding on rails. Fired by compressed air, the assembly reaches barrier impact speed of 30 mile/hr in just one-tenth of a second.

During the test the dummies are wired to a tape drive machine that prints analog data on 14 FM channels simultaneously, the data being collected at the precise moment of impact. In the 250 msec in which the simulated crash is occurring, 35,000 points of information are recorded from the dummies' action.



American Motors' new engineering computer center is helping to solve engineering and advance design problems, meet safety standards and ensure compliance with exhaust emission requirements.

The material on the magnetized tape is then fed into the minicomputer to be digitized. In effect, this step breaks the continuous analog curve recorded during the crash into mathematically spaced points on a chart, each point equidistant from the other. The points represent an ascending G force rate as it developed during the impact.

When the information has been analyzed by the engineering computer system, it provides AMC researchers with details about what happens during a car crash as the occupant is forced forward, or as passenger restraints stretch to allow body movement, or as a head strikes an object inside the car.

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British Booklet Suggests

Small Businesses Could Profit From Computer Clubs

By Toni Wiseman
Of the CW Staff

MANCHESTER, England – Money is tight everywhere, but the National Computing Center (NCC) has come up with a suggestion which might both save money and move computer capability within reach of small firms. Their suggestion? Computer Clubs.

In a booklet entitled "Computerguide 10: Computer Clubs," NCC has set forth basic guidelines and suggestions for the initiation of such cooperative associations.

The first and the essential step, according to NCC, is a feasibility study. Its purpose is to define particular problems pertinent to each company interested in participating in a club, and to determine whether it is possible to develop a common system to overcome these problems.

NCC recommended that the study be conducted by a team of two – a data processing expert and an industry expert. The study results should give details of and comments on common systems to satisfy member needs; decide whether such a system could and should be computer-based; assess the benefits the use of such a system would bring; and estimate the costs of producing such a system.

If the findings warrant the development of a system, the companies are justified in forming a computer club, according to the booklet. Such an association, in NCC's estimate, is best formed by those companies who took part in the feasibility study and who intend to cooperate in the project to develop a common system.

Club Committee

A committee is a necessary element in any association. NCC recommended that committee members be representative of member companies and possibly of the bodies providing specialist consultancy to the project.

The committee would be responsible for a wide scope of tasks including:

- A development program for the design and specification of the system, including completion dates, costs and training schedules.
- Progress reports to keep all members informed of project status.
- Contract negotiations with hardware or service suppliers. While they would be in the best position to negotiate any contract terms, NCC cautioned that members should sign individual contracts.
- Procedures to control the transportation of data from companies to the processing unit, particularly if a central bureau is running the system in batch mode.

Other committee responsibilities would include club accounts, policies for terminating membership, administration costs, systems options and future projects.

Cooperative Benefits

Club members would benefit from the pooling of information, most probably in the form of published surveys and guides. In addition, computer education and specialized training would be available to members at reduced rates since the cost of the learning package would be shared.

The prime area of benefit and cooperation, however, would be applications, NCC suggested. Though the type of system in which members would be interested could vary greatly from industry to industry, NCC feels that applications such as payroll, stock control, purchase analysis and production control could be of interest to many groups.

Cooperation in the development of common systems would result in the benefits of reduced costs through sharing and more efficient use of skilled DP staff, NCC said. In addition, the companies would be involved in defining a system to meet their own requirements; the risks involved in "going it alone" would be avoided; and the association, as a consortium, would carry more weight in negotiations with the computer industry, it added.

Societies/ User Groups

Educators Gather For Adcis Meeting

ANN ARBOR, Mich. – The School of Dentistry at the University of Michigan will host the summer conference of the Association for the Development of Computer-Based Instructional Systems (Adcis), August 7-9.

The conference, emphasizing the justification of computer-assisted and computer-managed instruction, will include an address by Jesse E. Laskin, assistant to the General Council of the National Science Foundation (NSF), on NSF's interpretation of the "public domain" status of computer teaching programs.

For further information contact William F. Fitzgerald, Director, Caident Project, School of Dentistry, University of Michigan, 48104.

Society Happenings

NCR Users Form New Group

SACRAMENTO, Calif. – All NCR users who offer computer or software services for sale to the general public are invited to join SBUG (NCR Service Bureau Users Group), which was recently formed in San Diego at the NCR Federated Users Group annual meeting.

Ray W. Johnson, Systems Data Processing Corp., was elected president of SBUG. Dave Robertson, Professional Data Processing Corp. is vice-president and Laird Sloan, Automated Systems Corp., secretary-treasurer.

N.Y. Chapter Formed

NEW YORK – Business Forms Management Association has formed a New York chapter.

Those interested in membership should contact George V. Meller, BFMA, One Park Avenue, 10016.

On-Line Proceedings Available

MIDDLESEX, England – The On-Line 72 conference proceedings on the design and applications of on-line interactive computer systems are now available for $78 from On-Line 72, Brunel University, Uxbridge, Middlesex, England.

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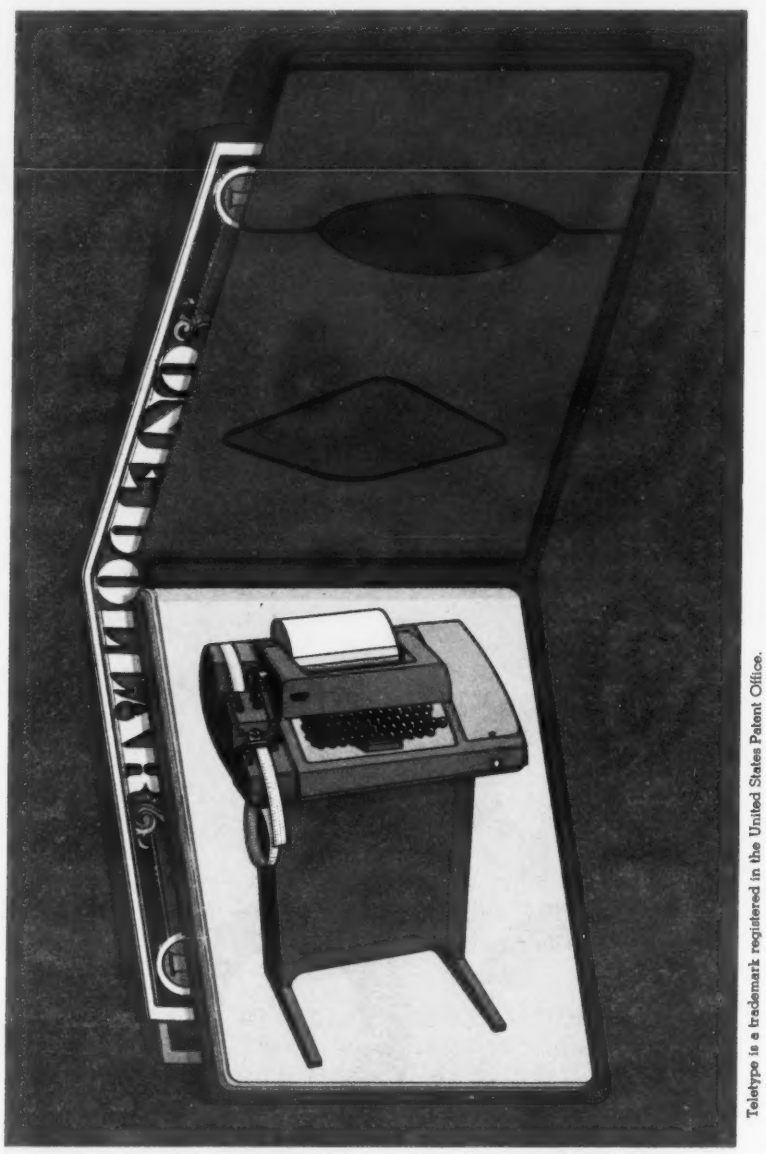

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Datapoint delivers at Tiburon Vintners

Tiburon Vintners, Windsor, Calif., is one of the fastest growing wineries in the United States. Utilizing a marketing program based largely upon direct mail, the company has combined its fine Northern California wines with a unique personalized label program to go from zero in 1966, its startup year, to over $6 million in sales in 1972. Because the company's marketing operation is based largely on mailings, one of its most valuable possessions is its master customer list. This list, now containing more than 300,000 names and constantly growing, is maintained and updated via two Datapoint 2200 business computer systems and associated magnetic tape and serial printer units.

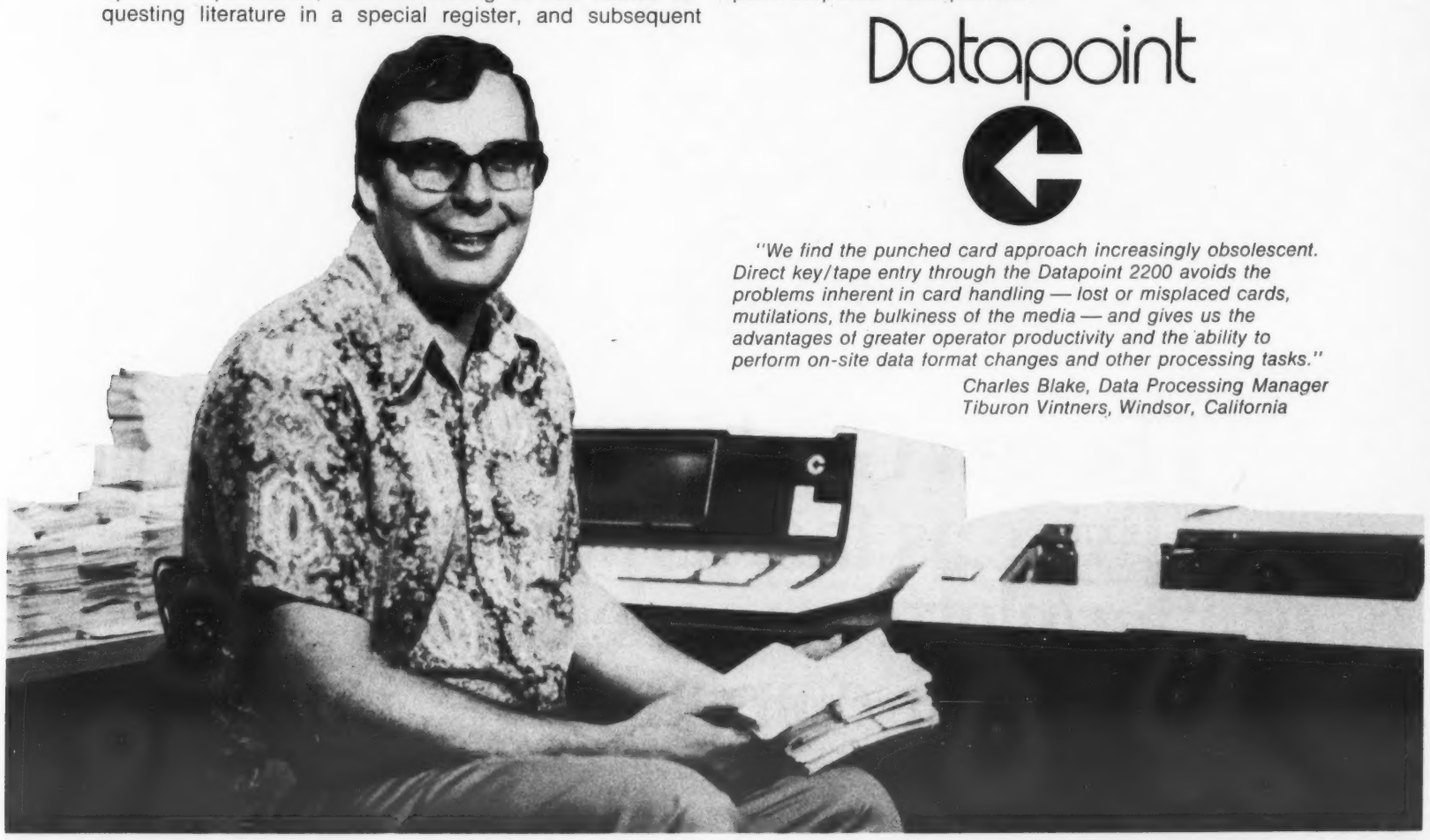
The Datapoint 2200's with their typewriter-like keyboards and video displays allow easy entry to the master mailing list of all changes — new names, address changes, deletions, updates to cumulative purchase totals and other key buyer data. These changes are keyed in by the operator, visually verified on the video display and stored in the system's cassette tape for subsequent "pooling" on a larger tape in the peripheral unit. This data in turn is integrated directly into the master list. The speed and accuracy of data entry attainable with the 2200's plus their ability to accept and store different categories of entry information makes it possible to handle swiftly a large volume of list changes. At Tiburon these changes now average more than 1,000 a day and range much higher in peak sales periods.

Since the 2200 is a fully programmable general purpose computer, it's easy to change programs for each different use made of the system simply by changing tape cassettes, a process little different from changing a stereo tape deck. Special requirements, such as storing of new names requesting literature in a special register, and subsequent printing out of gummed Cheshire labels on the Datapoint printing unit for same-day response, can also be accommodated. Similarly, data on productivity of various mailing lists used to solicit new customers can be readily tabulated via the Datapoint and used to guide subsequent new marketing efforts. And, unlike standard keypunch machines, use of the Datapoint, with its typewriter-like keyboard, requires no special training.

"The Datapoint systems give us speed in data conversion and entry where and when speed is important to us," said Charles Blake, Tiburon data processing manager. "We bypass the punched card and go directly to high speed computer media. The ease with which we can change programs allows us a versatility simply not attainable with other entry systems. For instance, we can display a number of different entry formats and store and tabulate various categories of information for special management reports. I'd estimate that the Datapoint systems increase our data conversion and entry productivity in this area by about 25%, and give us a capability for on-site data handling just not attainable otherwise."

Tiburon Vintners' experience with the Datapoint 2200 is not unique. The power and flexibility of this system, the ease with which programs can be created and changed, and the availability of peripheral systems, have made it ideal for a variety of complex data conversion and entry requirements, for data transmission and for on-site data processing at numerous installations around the world. Prices on the Datapoint 2200 begin at $6,040. For further information contact the Datapoint sales office nearest you or write or call Datapoint corporate headquarters.

Datapoint



"We find the punched card approach increasingly obsolescent. Direct key/tape entry through the Datapoint 2200 avoids the problems inherent in card handling — lost or misplaced cards, mutilations, the bulkiness of the media — and gives us the advantages of greater operator productivity and the ability to perform on-site data format changes and other processing tasks."

Charles Blake, Data Processing Manager
Tiburon Vintners, Windsor, California

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Conference Views Artificial Intelligence

STANFORD, Calif. – The Third Joint Conference on Artificial Intelligence will be held at Stanford University, August 20 through 24.

The program includes sessions on theory, applications and implications of artificial intelligence; robot implementations and language; psychology; and hardware and software.

Two tutorial lectures are also scheduled, which will include papers on automatic programming, computer vision and artificial intelligence and education.

One session will deal with "Natural Language: Speech." Papers will be presented covering systems organization for speech understanding, speech understanding through syntactic and semantic analysis, and mechanical inference problems in continuous speech understanding.

Robots Revisited

Robots will be the focal point of several program sessions. Scheduled topics range from "A Mobile Hand-Eye System" and "Design and Construction of a Versatile Robot Capable of Performing Tasks," to "A Robot Planning System Based on Problem Solvers."

"Outlines of a Computer Model of Motivation" and "Toward a Model of Human Game Playing" are two of the papers which will be presented during the session on psychology and artificial intelligence.

For further information contact Dr. Nils J. Nilsson, Artificial Intelligence Center, Stanford Research Institute, Menlo Park, Calif. 94025.

Societies/ User Groups

Meeting Focuses on Parallel Processing

SYRACUSE, N.Y. – The 1973 Sagamore Computer Conference on Parallel Processing will be held at the Sagamore Retreat, August 22-24.

Wednesday afternoon there will be a session on sequential-parallel transformation and modeling. Papers presented during this session will include "A Graph Model of Parallel Computation and Its Implementation" and "Measurement of Parallelism in Ordinary Fortran."

Parallelism in tape-sorting, a parallel algorithm for maximum flow problems, and parallel implementation of a two-dimensional model are a few of the topics which will be discussed at the parallel processing techniques session Thursday morning.

The second session Thursday morning will cover software design, and include papers on "Process Communication Pre-Requisites or the IPC-Setup Revisited" and "Software Design of Multiprocessing Support in OS/VS2."

Thursday afternoon's schedule includes sessions on processor components with a discussion of high-speed multiplier/divider iterative arrays. Processor organizations and scheduling sessions will also be held that afternoon.

Registration is $85 for IEEE or ACM members, $90 for others, including meals and lodging. Further details are available from Diane Sims, Dept. of Electrical and Computer Engineering, 327 Link Hall, Syracuse University, 13210.

Calendar

August 5-8, Palm Beach – **Mathematical Programming Seminar**, Haverly Systems, Inc. and MaGen Users. Contact: George M. Lowell, Haverly Systems, Inc., 4 Second Ave., Denville, N.J. 07834.

August 6-8, Chicago – **National Association for State Information Systems.** Contact: Nasis, Iron Works Pike, Lexington, Ky. 40505.

August 8, Washington, D.C. – **Computer Law Association.** Contact: Robert P. Bigelow, 28 State St., Room 2200, Boston, Mass. 02109.

August 12-17, Henniker, N.H. – **Engineering Foundation Conference,** "Making Service Industries More Productive Through Computers." Contact: Engineering Foundation, 345 East 37th St., New York, N.Y. 10017.

August 13-17, Miami – **Share.** Contact: Share, Inc., Suite 750, 25 Broadway, New York, N.Y. 10004.

August 26-31, Stanford Calif. – **8th International Symposium on Mathematical Programming,** sponsored by the Mathematical Programming Society. Contact: Richard W. Cottle, Department of Operations Research, Stanford University, Stanford, Calif. 94305.

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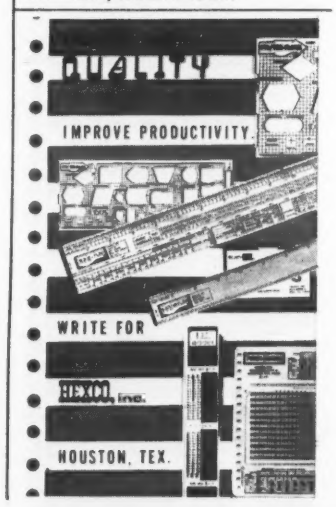

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COMPUTER INDUSTRY

CI Notes

IBM Separate Trial Denied

NEW YORK – Judge David Edelstein last week denied an IBM motion for a trial on the market issues involved in its antitrust suit with the U.S. government.

IBM had asked for a special trial on the market share issue "within 30 days." The request was made last October.

In last week's ruling, Edelstein said "market share is no holy talisman that alone determines whether a defendant has monopolized an industry."

In addition, he said "attention must also be given to the marketing practices in the industry, the importance of growth and technological change, and other considerations that can only be developed at a full trial."

Legal sources said the ruling, after almost 10 months, indicates Edelstein is now giving more attention to the IBM case and that he may soon issue an opinion on other pending matters such as the requested contempt citation against IBM.

DEC to Buy RCA Area

MAYNARD, Mass. – Digital Equipment Corp. has agreed in principle to purchase all of RCA Corp.'s 173 acres in Marlboro, Mass., and 700,000 square feet of manufacturing and administrative facilities.

The Marlboro plant will be used as an extension of DEC's current operations, a spokesman said. Headquarters will remain in Maynard. Subleasing part of the space is under consideration, he added.

Honeywell Has Bid Problems

CW West Coast Bureau

SACRAMENTO, Calif. – Honeywell reported last week that it was encountering severe problems in its effort to bid on the Stephen P. Teale consolidated computer center, a project which may cost $40 million.

Terry Chambers, deputy secretary of the state business and transportation agency, said a letter received from Honeywell indicated it was having problems in meeting the conversion mandate both in fixed price and date of conversion.

Honeywell and IBM are the two remaining firms out of a field of 12 which have indicated they intend to bid on the center [CW, July 18]. If one firm drops out, the other would be disqualified.

HP Contracts for Tally Printers

KENT, Wash. – Tally Corp. and Hewlett-Packard Co. have signed an agreement covering the purchase by HP of a number of Tally Series 2000 line printers and the right to manufacture additional printers.

Okidata Acquires Bridge

MOORESTOWN, N.J. – Recently formed Okidata Corp. has agreed to acquire Bridge Data Products, Inc., a subsidiary of Photon Inc.

The acquisition gives "Okidata a strong manufacturing and sales base in the U.S. to complement the products being imported by Okidata from Japan," observed Okidata President David L. Nettleton.

IBM Tightens Security

SAN JOSE, Calif. – IBM has reinforced security precautions at its General Products Division here as a result of the alleged thefts of plans for three generations of disk drives.

IBM said precautionary measures include "numerous control and auditing procedures, centralization of copy centers, use of television cameras to monitor key areas of access and limited entry into sensitive development areas through computer-controlled badge and key locks."

IBM Documents Reveal

Juggling CPU, Memory Prices Old Hat

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – IBM has been juggling the prices of its memories and CPUs since the days of the 701 computer in order to achieve the highest profits possible from computer systems and to limit competition in the memory area, according to previously secret documents.

The documents indicate that the firm also discussed ways to unbundle without seriously losing any market share and apparently adopted those plans.

The documents revealing this are among the almost 1,200 documents that IBM during the past year had refused to turn over to the Justice Department, claiming they were covered by lawyer-client privilege.

However, these documents have recently been screened by IBM lawyers and released to the Justice Department.

In addition, the original plan for the 155 indicated that the minimum memory for the system would be in a separate box which would make it vulnerable to competition and which might look bad since the unit was to be sold with a minimum of 256K memory.

However, here again Learson told the engineers to find some way to integrate the minimum memory into the CPU mainframe box.

One of the memos showed that in 1970 IBM was worried over the memory prices planned for the 370 Series, feeling they were too high and would open the door to more competition.

"Announced NS (370) memory prices will be higher than 360 even though NS will utilize the N-9 memory used in the 360," one document stated, adding that the fact "means an exposure" to competition.

"This can be limited by properly allocating more cost to the CPU than to memory and bundling minimum memory," it added, indicating a pricing plan to reach this objective.

The group which made this recommendation to former IBM Chairman T. Vincent Learson claimed the strategy was "sound businesswise . . . in fact, Mr. Haddad indicated the practice originated with the 701," the memo said.

In another memo the IBM planners stated that under the planned pricing for the 155 the project "looks good" with a 48-month profitability of 32%.

However, the document noted the profit on the memory segment of the system would be 35% to 38% over the time period while the CPU profit would be "just under normal."

However, Learson disagreed with the pricing plan set for the system and "asked for further study of reducing memory profits and raising that of the CPU," which was apparently done.

The documents also reported that IBM has been playing the mid-life kicker game in the peripherals area for quite a while.

For example, a 1966 memo on the 2314 disk drive said that IBM was waiting to see what the competition would do before it announced an enhancement.

"Our strategy is to see what the competitor does before we show our hand. At this time we see no need for immediate announcement of the 2314 Model II," it added.

Learson Deposition

IBM, U.S. Lawyers Quibble a Bit

By E. Drake Lundell Jr.
Of the CW Staff

WHITE PLAINS, N.Y. – Bickering and sharp exchanges between IBM and Justice Department lawyers highlighted the opening rounds of the government's deposition proceedings of former IBM chairman T. Vincent Learson here last week.

Learson remained cool, almost bored, even if a bit nervous, throughout the opening rounds of the interrogation by the Justice Department team headed by Raymond Carlson.

And he stuck closely to the IBM line in answering the major lines of questioning which involved market shares of the competitors in the business and whether there was a difference between scientific and commercial computers or between in-house computer systems and outside services.

The infighting between the lawyers started at the outset when F.A.O. Schwartz, an attorney for Cravath, Swaine and Moore, the IBM law firm, got into a tug of war with Carlson over a government document that Schwartz requested to see, and the fighting continued throughout the day.

Throughout the session Learson and his lawyer indicated he had already covered much of the ground being covered by the Justice Department in a previous deposition in the Control Data case, but the government lawyers said they had not decided whether to use that deposition in their case.

Schwartz charged that the government lawyers were trying to trap Learson into making a statement that would contradict those made in the earlier deposition seven months ago and said that this was unfair.

In response to Schwartz's charges of unfairness, Carlson indicated that Schwartz was making speeches in an attempt to lead the witness into answers, a charge that Schwartz labeled as "slanderous, malicious and unjustified . . . and silly."

Learson also noted that he was on no payroll anymore and was only getting $20 a day to appear before the government questioners.

Carlson said he would make sure Learson would get the forms to fill out for the payment, to which Learson replied, "I'll frame them."

On more substantive issues, Learson told the questioners that market share figures were "loosely used by many people" and that they were "the most imprecise, inaccurate measure I've ever seen" of a company's position in the business.

Schwartz interjected that if "the government had bothered to attend the Telex case" they would have seen the problems with market share statistics, but "of course they didn't bother to attend."

IBM Charges Justice Attempted To Prevent Federal Purchases

By a CW Staff Writer

NEW YORK – IBM charged last week that the Justice Department sought to keep government agencies from purchasing IBM equipment while the government's antitrust suit against it was pending.

IBM made the charge in a filing in the Federal District Court for the Southern District of New York here claiming that a memo to that effect had been kept from IBM by the government attorneys.

IBM charged that the document showing the government move was contained in files that were "not previously searched or inadequately searched" when it had requested material from the government about the case.

Mitchell Involved?

According to the IBM filing, "the Department (of Justice) has documents involving former Attorney General John N. Mitchell and former assistant Attorney General Richard W. McClaren, which discuss injuring IBM commercially through exploitation of delay attributable to the government.

"Such documents include a plan, which the Antitrust Division in fact implemented without informing IBM, to persuade government users of EDP equipment not to acquire IBM equipment even though it was cheaper or better than competitive equipment, and such documents also include comments on the illegality or impropriety of such action."

IBM said these documents had not been supplied to it by the Justice Department or listed as privileged documents and said that "we assume for present purposes that that was because the files of senior officials of the department were not searched adequately and make this point herein to assure that the department recognizes its obligation to do so."

One source also noted last week that the prohibition, if it was in fact implemented by the Justice Department, seemed not to apply to Justice itself since that agency has sole-sourced two computer systems from IBM in the past few years.

Telex, IBM Want More Damages

TULSA, Okla. – Telex attorneys have submitted their request for attorney fees to Judge Sherman Christensen here in case they win their antitrust case against IBM.

In all, the attorneys have requested that IBM pay $1.3 million in legal fees if it is found guilty of the antitrust charges against it.

At the same time, both sides have filed their final damage figures in the case to Christensen who is expected to rule on it momentarily.

The final figures requested by Telex come out to $1.08 billion, which is triple the amount it claims as damages by IBM's alleged monopolistic practices.

IBM has raised its claim from $25 million to $48 million on the countersuit it filed against Telex charging unfair trade practices and theft of trade secrets.

Telex has admitted to one charge of copyright infringement and suggested it be fined $250 for the infraction.

The request for attorney fees includes a bid by Floyd Walker for $467,325 which would reimburse him at a rate of $75/hr for the 6,231 hours that he spent on the case.

The total fee for senior attorneys of the group that prepared the case prior to the trial, including Walker, amounts to $560,100, while the total for all of the junior attorneys on the case comes to $424,832, including Walker's associates.

The remaining $305,040 is for paralegal people, primarily Telex employees, who worked on the case over the past year and a half, who are asking $30/hr.

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Financing Alleviates Pressure

Boothe Computer: 'No Fire Sale'

By Marvin Smalheiser
CW West Coast Bureau

SAN FRANCISCO – The financial squeeze that put the heat on Boothe Computer Co. and prompted talk of acquisition is not going to result in a "fire sale," according to D.P. Boothe Jr., board chairman.

Since the leasing company's annual meeting several weeks ago, he said, negotiations have been consummated with banks and the heat is off.

Boothe said "only the most preliminary and tentative discussions" for merger are being conducted. "We are open to a merger but we are not holding a fire sale."

He added that Boothe is "looking to some major refinancing to take place within the next six to eight months but it is premature to get into detail. A hell of a lot has to be done."

Boothe's remarks at the annual meeting revealed that "serious discussions" were underway for substantial equity.

But an agreement with Wells Fargo Bank has provided Courier Terminal Systems of Phoenix, a subsidiary, with a $5 million extension of credit for lease financing.

An agreement with Fidelity Philadelphia Bank provided an $1.8 million extension of credit until December 1974 for another subsidiary, Boothe Airside Systems.

Rentals and Accounting

Boothe attributed the cash problems to the erosion in rentals from the company's portfolio of IBM 360 computers and to accounting procedures.

"We'll write our computers down to zero by 1978 but many of our competitors will carry a 10% to 15% residual value by 1978.

"If we were not writing ours down to realizable value on a conservative basis, we would have $22 million more on our balance sheet than we do now."

In May, the company reported a 1972 loss of $37.7 million from continuing operations.

Of this amount, $35 million came from a depreciation in the company's 360 portfolio taken on the advice of company auditors. The rest was writedowns for Courier research and development and goodwill items in some companies.

Courier is shipping a "couple of hundred CRT terminals a month" with an installed base of about 4,500, he added.

"You can't downgrade leasing," Boothe said, citing the company's $30 million income. But he added that with the passage of time the 360 portfolio will continue to show erosion of rentals.

"We have a portfolio of IBM 360s costing $215 million that has a book value of $85 million. "We will have to keep working the portfolio for the indefinite future to recover the investment," he said.

New Data 100 Unit to Begin Production of Minicomputers

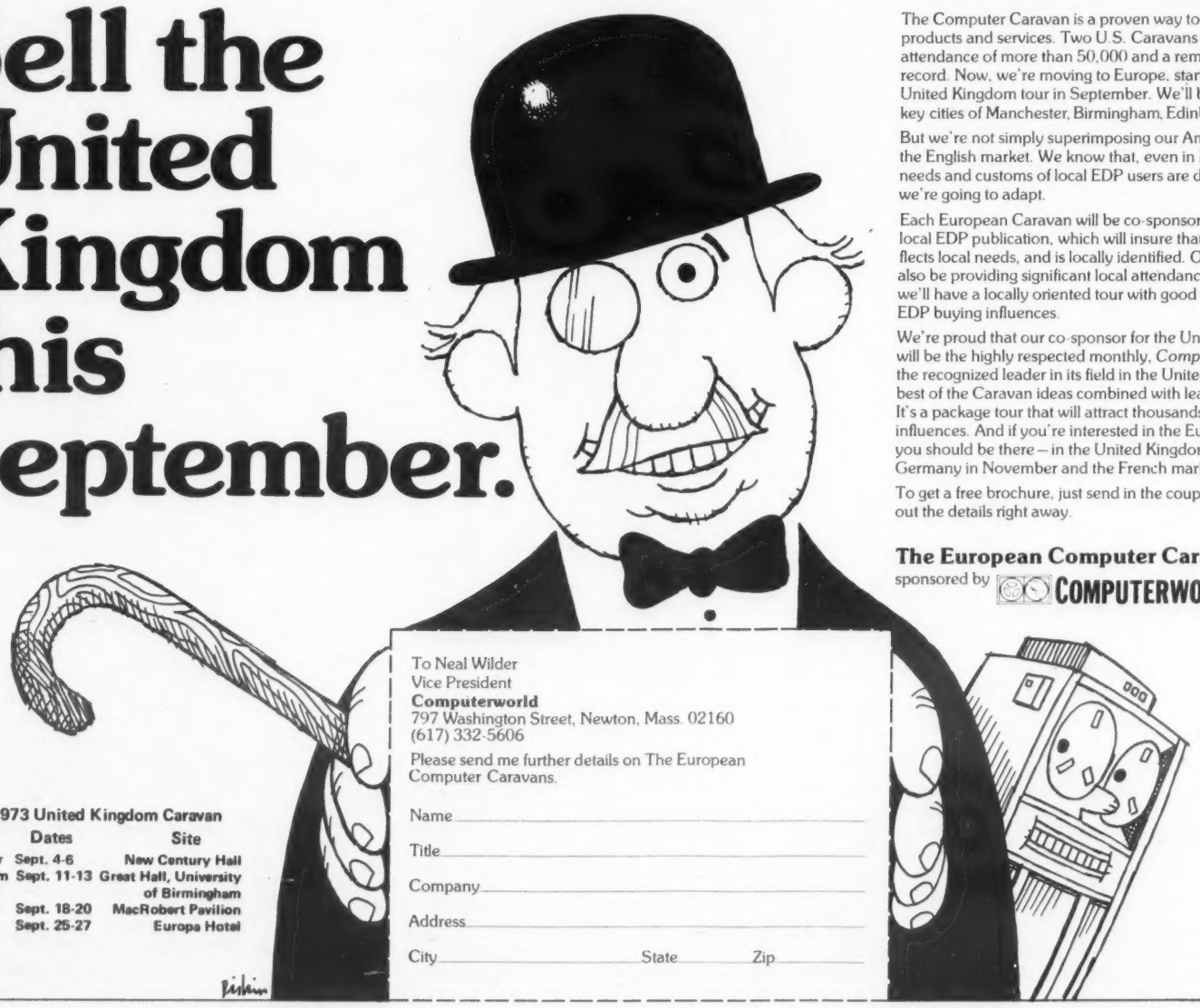
MINNEAPOLIS, Minn. – Data 100 has acquired California Data Processors, Santa Ana, Calif., which recently received production orders valued at more than $2.6 million for the sale of over 1,500 minicomputers and over 200 microprogrammable minicomputers.

The firm has previously been engaged in the design and licensing of minicomputers and minicomputer memories.

Shipments will begin this month, the firm said.

Data 100 acquired the assets of California Data and a license to market its technology. California Data will operate as a wholly owned subsidiary of Data 100.

Sell the United Kingdom this September.



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The 1973 United Kingdom Caravan

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Birmingham	Sept. 11-13	Great Hall, University of Birmingham
Edinburgh	Sept. 18-20	MacRobert Pavilion
London	Sept. 25-27	Europa Hotel

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USSR's Youngest Industry Progressing at Fast Tempo

By A.A. Reut
Novosti Press Agency

MINSK, USSR – The Russian computer industry is developing at a very fast tempo. In 15 years, the republic's youngest industry has progressed from tube computers to the versatile Minsk-32 to the ES-1020 with integrated circuits.

The output of computers at the Ordjonikidze plant is rapidly increasing and will treble between 1971 and 1975.

The top of the line of the Minsk family is the Minsk-32, which has been in production since 1970. Many countries are now buying this machine from V/O Electronorgtechnika, the Soviet foreign trade organization that handles electronic equipment.

The Minsk-32 has a multiprogram working mode, wide structural possibilities and flexible construction. Up to 136 peripheral devices can be connected to it.

It is one of the most economical machines in its class; automatic control systems and even whole industries have been based on and developed according to it.

Quality Control

In the production of the machine, a Minsk-32 handles quality control and determines the setting up of computers on special rigs.

The framework and devices are assembled on conveyor belts and numerically controlled machine tools ensure high quality in computer components.

Recently we also began to manufacture the ES-1020, one of the models in the Unified System of the socialist community.

The computer's program stock contains translators from a number of languages, and most important, the ES-1020 can operate in combination with other models in the Unified System.

A.A. Reut is director of the Ordjonikidze computer plant in Minsk.

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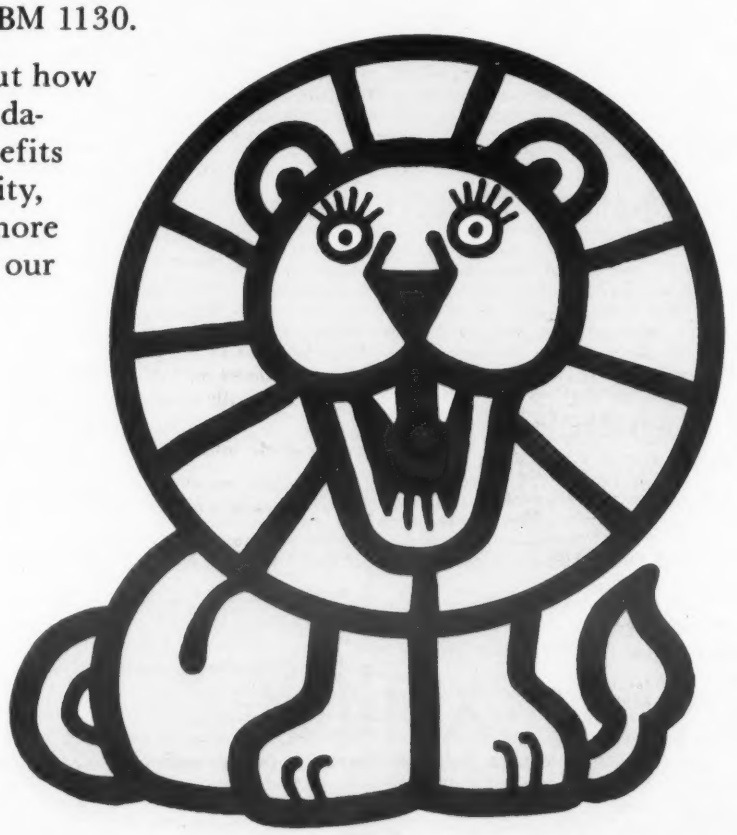

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Director
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Oberlin College plans to convert its administrative data processing from a batch to an interactive computing system. A new computing center is under construction and new hardware facilities are planned. The Director-ASD will be responsible for organizing and directing the acquisition of software, its modification and augmentation to meet local needs and the planning and writing of such additional software systems as needs indicate. Supporting staff reports to him. The incumbent should have an MBA or the equivalent, systems analysis and programming experience. Salary is negotiable; fringe benefits are excellent. Interested applicant should submit resume to:

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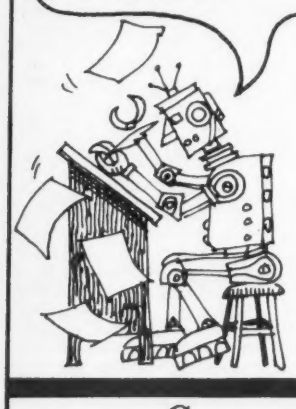

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Records in Quarter, Half

Burroughs, IBM Earnings Rise

IBM and Burroughs earnings and revenues in the second quarter and half year reached record proportions.

Although IBM's gains in terms of percentages were less than those for comparable 1972 periods, they were greater than those in the first quarter of this year.

Burroughs' six month operating earnings climbed 31% and, with a $2.5 million capital gain, totaled $44.9 million or $2.35 a share compared with $32.5 million or $2.22 a share.

At IBM, Chairman Frank T. Cary said "gross income from rentals and services increased 12.3% over the first six months of 1972. Outright purchases of DP equipment were lower in the second quarter and for the six months than the comparable 1972 periods.

"With several major newly announced System/370 products scheduled for delivery in increasing quantities during the remaining months of the year, we expect shipments for the year to be at a high level," he said.

In the second quarter ended June 30, IBM earnings rose 14% to $356.7 million, or $2.44 a share, compared with $312.2 million or $2.15 a share in the year-ago period.

Per share earnings for the 1972 periods have been adjusted to reflect a 25% stock split effected in the 1973 period.

Revenues climbed 7.7% to $2.55 billion, a record for the second quarter, from $2.36 billion the year before.

In the 1972 period, however, the firm posted an earnings rise of 22.4% on a 21.8% revenue gain.

During the first quarter of 1973, IBM posted an 11.3% gain in earnings on a 6% revenue increase.

For the six months, earnings rose 12.8% to $696.9 million or $4.78 a share from $617.9 million or $4.27 a share. Revenues rose 6.8% to $5 billion from $4.68 billion.

Burroughs Net Climbs Sharply

In addition to record earnings and revenue in both periods, Burroughs orders and backlogs also set new highs.

Worldwide orders for the six months showed a 24% increase over the 1972 period, President Ray W. Macdonald observed. Orders were strong, both in the U.S. and overseas, he said, and worldwide backlogs rose 31% since the beginning of the year.

Burroughs' second quarter earnings rose 29% to $26.1 million or $1.36 a share compared with $20.3 million or $1.09 a share in the corresponding 1972 period.

Revenues jumped to $314.3 million from $252 million in the year-ago period, a 25% rise.

For the six months, the firm recorded a 31% rise in operating earnings, which, after a $2.5 million or 13 cents a share capital gain from the sale of securities, resulted in earnings of $44.9 million or $2.35 a share. In the 1972 period, the firm earned $32.5 million or $1.75 a share.

Operating revenues during the first half also jumped sharply, up 25% to $588.8 million compared with $472.6 million. In addition, securities sales resulted in $3.5 million in income.

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MohawkCutsYear Loss to $431,000

UTICA, N.Y. – As in the individual periods, the year-end report for Mohawk Data Sciences Corp. continued to "reflect the costly transformation to a systems-oriented rental base combined with rental discontinuances of early equipment lines," according to President Richard P. Rifenburgh.

The loss, however, was down from the year before, totaling $431,000 or 7 cents a share compared with $765,000 or 13 cents a share.

Revenues for the year, including about $8.6 million from sales to Randolph Computer Corp., totaled $143,216 compared with $119,795 in the previous year.

"We have made good progress in systematically reducing domestic overhead while expanding volume, and the result of those efforts should become apparent in the current year," he said.

Microdata Earnings Rise in 9 Months

IRVINE, Calif. – Record nine month revenues at Microdata Corp. led an upswing in earnings for the period, but third quarter earnings were off from the comparable 1972 period.

In the nine months, earnings were up to $575,892 or 37 cents a share compared with $432,921 or 34 cents a share in the year-ago period.

Third quarter earnings totaled $53,327 or 3 cents a share after a $26,000 special credit. This compares with earnings of $179,397 or 14 cents a share, including a $93,194 special credit.

Revenues for the quarter rose to $2.3 million from $1.6 million.

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Earnings Reports

ANDERSON JACOBSON
Year Ended March 31

	1973	1972
Shr Ernd	$.15	$.05
Revenue	5,882,953	4,180,444
Spec Cred	a35,746	.....
Earnings	375,026	123,213

a-Gain from sale of land.

NATIONAL CSS
Three Months Ended May 31

	1973	1972
Shr Ernd	$.35	$.26
Revenue	5,280,368	3,783,273
Tax Cred	52,200	128,603
Earnings	387,284	281,464

INTEL
Six Months Ended June 30

	1973	1972
Shr Ernd	$.60	a$.26
Revenue	23,544,700	8,456,704
Tax Cred	.....	523,000
Earnings	2,562,216	1,038,000

a-Adjusted for a three-for-two stock split paid in May 1973.

COMPUTER INSTRUMENTS
Four Months Ended April 20

	1973	1972
Shr Ernd	.....	$.03
Revenue	$1,325,094	1,382,724
Earnings	(80,863)	52,186

NATIONAL DATA
Year Ended May 31

	1973	1972
Shr Ernd	$.38	$.26
Revenue	16,000,000	9,000,000
Earnings	1,884,000	1,275,000

DIGITAL COMPUTER CONTROLS
Three Months Ended May 31

	1973	a1972
Revenue	$1,224,872	$563,653
Tax Cred	19,900	.....
Loss	20,815	97,950

a-Restated to reflect a pooling-of-interests.

CAMBRIDGE MEMORIES
Three Months Ended May 31

	1973	1972
Shr Ernd	$.13	$.08
Revenue	3,605,583	1,104,627
Tax Cred	.....	41,729
Earnings	167,194	81,689
9 Mo Shr	.33	.13
Revenue	8,271,910	2,636,495
Tax Cred	62,880	64,700
Earnings	425,682	129,546

NUCLEAR DATA
Three Months Ended May 31

	1973	1972
Shr Ernd	$.26	.....
aRevenue	$4,685,015	$3,087,693
Tax Cred	40,000	.....
Earnings	218,860	d(592,902)

a-From continuing operations. d-Includes loss from discontinued operations.

APECO
Three Months Ended May 31

	a1973	1972
Shr Ernd	$.09	$.15
Revenue	38,789,600	33,205,800
Earnings	973,200	1,525,600
6 Mo Shr	.16	.27
Revenue	69,773,800	60,484,100
Earnings	1,774,700	2,695,800

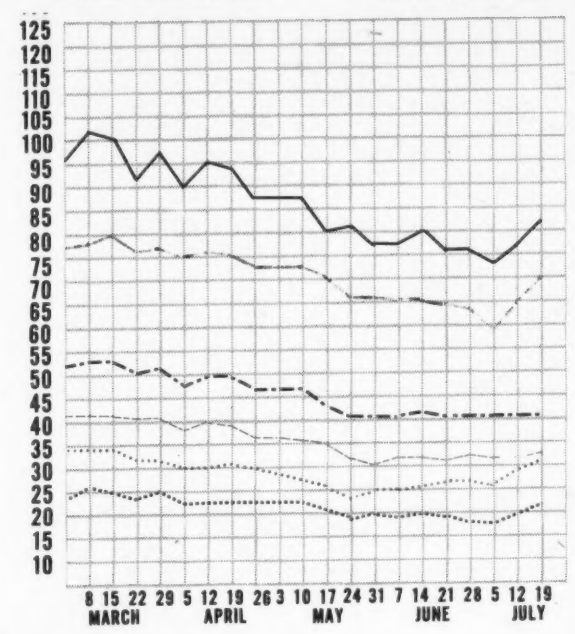
a-Includes results of Cascade Data.

FABRI-TEK
Year Ended March 30

	1973	1972
Shr Ernd	$.28	.....
aRevenue	22,309,441	$13,638,010
Disc Op	.....	(199,764)
bSpec Cred	625,998	1,854,879
Earnings	919,731	(672,514)

a-From continuing operations. b-In 1973, gain on purchase of company's outstanding debentures and a tax credit; in 1972, includes gains on purchase of outstanding debentures, and sale of Nicolet Instrument Corp. and Fabri-Tek Micro Systems Inc., less provision for loss on sale of Fabri-Tek Education Systems Inc. and writeoff of equipment.

COMPUTERWORLD Computer Stocks Trading Indexes



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Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1973 RANGE (1)	CLOSE JUL 19 1973	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	211-245	232 1/4	+7 7/8	+3.5
N	COLLINS RADIO	16- 26	20	+2	+11.1
O	COMPUTER AUTOMATION	5- 16	11	+ 5/8	+6.0
N	CONTROL DATA CORP	31- 62	35	- 7/8	-2.4
O	DATA GENERAL CORP	28- 46	40 1/4	+4 3/4	+13.3
O	DATAPOINT CORP	11- 21	11 1/4	0	0.0
O	DIGITAL COMP CONTROL	2- 6	3 1/2	+ 3/4	+27.2
N	DIGITAL EQUIPMENT	73-105	87 5/8	+2 1/8	+2.4
N	ELECTRONIC ASSOC.	4- 9	5 3/8	0	0.0
A	ELECTRONIC ENGINEER.	6- 11	9	+1	+12.5
N	FOXBORO	23- 35	34 1/2	+2 3/4	+8.6
O	GENERAL AUTOMATION	22- 55	31	+2 1/2	+8.7
O	GRI COMPUTER CORP	1- 3	1 1/4	+ 1/8	+11.1
N	HEWLETT-PACKARD CO	74- 95	83 5/8	+3 1/4	+4.0
N	HONEYWELL INC	98-139	113 1/2	+4 1/2	+4.1
N	IBM	299-340	315	+1 1/4	+0.3
O	INTERDATA INC	7- 13	8 1/2	+ 1/4	+3.0
N	MEMOREX	2- 19	4 7/8	0	0.0
O	MICRODATA CORP	2- 10	2 5/8	- 1/8	-4.5
N	NCR	27- 37	36 1/2	+1 3/8	+3.9
N	RAYTHEON CO	22- 34	27 1/2	+2 1/4	+8.9
N	SINGER CO	45- 74	51 1/4	+3 1/4	+6.7
N	SPERRY RAND	36- 50	45 1/8	+2 1/4	+5.2
A	SYSTEMS ENG. LABS	3- 8	3 3/4	+ 1/4	+7.1
N	TEXAS INSTRUMENTS	83-101	97 3/4	+6 1/2	+7.1
O	ULTIMACC SYSTEMS INC	1- 11	4 1/4	- 1/4	-5.5
N	VARIAN ASSOCIATES	10- 20	12 3/4	+1 1/2	+13.3
N	WANG LABS.	13- 34	17 3/8	+1 5/8	+10.3
N	XEROX CORP	141-169	155	+2 5/8	+1.7
	LEASING COMPANIES				
A	BOOTHE COMPUTER	1- 5	1 5/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2 1/8	0	0.0
O	COMDISCO INC	6- 17	7 5/8	+ 1/2	+7.0
O	COMMERCE GROUP CORP	3- 4	3 7/8	+ 1/4	+6.8
O	COMPUTER EXCHANGE	1- 1	1/2	0	0.0
A	COMPUTER INVSTRS GRP	2- 8	2 1/2	- 1/4	-9.0
O	COMP. INSTALLATIONS	1- 2	1	0	0.0
M	DATRONIC RENTAL	2- 3	2 1/8	- 1/8	-5.5
A	DCL INC	1- 3	1 1/4	+ 1/8	+11.1
A	DEARBORN-STORM	12- 26	18	+2 1/2	+16.1
N	DPF INC	5- 9	7 1/2	+ 1/2	+7.1
O	EDP RESOURCES	1- 3	1 5/8	+ 1/8	+8.3
A	GRANITE MGT	2- 6	3 3/8	0	0.0
A	GREYHOUND COMPUTER	3- 6	4 1/2	+ 1/8	+2.8
A	ITEL	4- 12	5 5/8	+ 5/8	+12.5
N	LEASCO CORP	8- 18	11 3/4	+1 7/8	+18.9
O	LEASPAC CORP	2- 8	2 3/4	- 1/8	-4.3
O	LECTRO MGT INC	1- 2	1 1/4	0	0.0
O	NRG INC	6- 15	6	- 1/4	-4.0
A	PIONEER TEX CORP	5- 8	4 7/8	0	0.0
A	ROCKWOOD COMPUTER	1- 3	1 1/2	+ 1/4	+20.0
N	U.S. LEASING	16- 36	19 1/2	+2 1/8	+12.2
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 5/8	- 1/8	-7.1
A	APPLIED DATA RES.	2- 4	2 3/8	+ 1/2	+26.6
O	APPLIED LOGIC	1- 3	7/8	- 1/4	-22.2
N	AUTOMATIC DATA PROC	39- 94	53 1/4	+8 3/4	+19.6
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	8- 9	7 1/2	0	0.0
O	COMPUTER DIMENSIONS	2- 5	2 3/4	0	0.0
O	COMPUTER DYNAMICS	1- 2	3/8	- 1/4	-40.0
O	COMPUTER HORIZONS	1- 6	2	0	0.0
O	COMPUTER NETWORK	1- 5	1 1/8	0	0.0
N	COMPUTER SCIENCES	2- 6	4	+ 5/8	+18.5
O	COMPUTER TASK GROUP	1- 2	1 1/2	0	0.0
O	COMPUTER TECHNOLOGY	1- 3	1	0	0.0
O	COMPUTER USAGE	4- 9	5 1/4	+ 1/8	+2.4
O	COMRESS	1- 2	1/4	0	0.0
O	COMSHARE	4- 9	4 1/4	+ 1/4	+6.2
N	CORDURA CORP	5- 15	6 1/2	+1 1/8	+20.9
O	CYBERNATICS INC	1- 3	1 7/8	+ 1/4	+15.3
O	DATATAB	2- 4	1 3/4	0	0.0
A	ELECT COMP PROG	1- 2	1 3/8	- 3/8	-21.4
N	ELECTRONIC DATA SYS.	29- 56	39 3/4	+5 1/4	+15.2
O	INFONATIONAL INC	1- 2	1/4	- 1/8	-33.3
O	INFORMATICS	2- 6	4 1/2	+1 1/4	+38.4
O	I.O.A. DATA CORP	1- 1	5/8	- 1/8	-16.6
O	IPS COMPUTER MARKET.	1- 5	1	- 1/8	-11.1
O	KEANE ASSOCIATES	3- 4	3 1/4	+ 1/4	+8.3
O	KEYDATA CORP	6- 12	6 1/8	+ 3/8	+6.5
O	LOGICON	3- 7	4 1/2	+1 1/8	+33.3
A	MANAGEMENT DATA	2- 5	2 3/8	+ 1/2	+26.6
O	NATIONAL CSS INC	18- 42	27	+1 1/2	+5.8
O	NATIONAL COMPUTER CO	1- 1	3/8	- 1/8	-25.0
O	NATIONAL INFO SRVCS	1- 2	1/2	0	0.0
P	ON LINE SYSTEMS INC	12- 17	13 1/2	+1 1/2	+12.5
N	PLANNING RESEARCH	2- 7	2 7/8	+ 1/4	+9.5
O	PROGRAMMING METHODS	21- 24	23	0	0.0
O	PROGRAMMING & SYS	1- 1	3/4	+ 1/8	+20.0
O	RAPIDATA INC	5- 24	5 3/4	+ 1/2	+9.5
O	SCIENTIFIC COMPUTERS	1- 3	3/4	0	0.0
O	SIMPLICITY COMPUTER	2- 4	1 7/8	0	0.0
O	TBS COMPUTER CENTERS	2- 4	1 3/4	0	0.0
O	TCC INC	1- 1	1/2	0	0.0
O	TYMSHARE INC	6- 12	9	+1 1/8	+14.2
O	UNITED DATA CENTER	4- 6	3 3/4	- 1/4	-6.2
A	URS SYSTEMS	4- 8	4 1/8	+ 1/8	+3.1
N	WYLY CORP	4- 11	4 1/2	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	12- 34	15 3/4	+1	+6.7
O	ADVANCED MEMORY SYS	5- 23	7 1/4	+2 1/2	+52.6
N	AMPEX CORP	4- 7	5 3/8	+ 1/2	+10.2
O	ANDERSON JACOBSON	3- 6	3 1/4	0	0.0
O	BEEHIVE MEDICAL ELEC	6- 10	6 1/2	0	0.0
A	BOLT,BERANEK & NEW	6- 12	6 1/4	- 1/2	-7.4
N	BUNKER-RAMO	6- 18	11 3/8	+ 3/4	+7.0
A	CALCOMP	5- 13	8 1/4	+ 3/4	+10.0
O	CAMBRIDGE MEMORIES	8- 15	9	+ 3/4	+9.0
O	CENTRONICS DATA COMP	13- 28	24	+3 1/4	+15.6
O	CODEX CORP	9- 19	11	+ 1/4	+2.3
O	COGNITRONICS	1- 3	2 1/4	+ 1/2	+28.5
O	COMPUTER COMMUN.	1- 4	1	0	0.0
A	COMPUTER EQUIPMENT	2- 3	2 1/8	- 1/8	-5.5
O	COMPUTER MACHINERY	5- 13	6 3/4	+1 1/4	+22.7
O	COMPUTER TRANSCEIVER	1- 6	1 1/2	+ 1/8	+9.0
N	CONRAC CORP	15- 32	18 1/8	+1 1/2	+9.0
O	DATA ACCESS SYSTEMS	1- 3	1 5/8	0	0.0
O	DATA 100	9- 18	12 3/4	+ 1/2	+4.0
A	DATA PRODUCTS CORP	2- 4	3 1/4	+ 1/4	+8.3
O	DATA RECOGNITION	2- 3	1 1/2	0	0.0
O	DATA TECHNOLOGY	2- 5	2 1/8	- 1/8	-5.5
O	DECISION DATA COMPUT	8- 40	12 7/8	+4 3/4	+58.4
O	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
O	DI/AN CONTROLS	2- 4	1 3/4	0	0.0
N	ELECTRONIC M & M	3- 6	3 7/8	+ 3/8	+10.7
O	FABRI-TEK	2- 5	3	+ 1/2	+20.0
O	GENERAL COMPUTER SYS	5- 9	5	-1	-16.6
N	GENERAL ELECTRIC	56- 76	61 3/4	+2 5/8	+4.4
N	HAZELTINE CORP	5- 9	6 3/8	+1 3/8	+27.5
O	INFOREX INC	5- 23	7 1/4	+ 3/8	+5.4
O	INFORMATION DISPLAYS	1- 2	1/2	- 1/8	-20.0
O	INFORMATION INTL INC	10- 15	10 1/4	+ 1/4	+2.5
A	LUNDY ELECTRONICS	3- 9	4 1/4	+ 7/8	+25.9
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
A	MILGO ELECTRONICS	14- 28	17 1/8	+1 7/8	+12.2
N	MOHAWK DATA SCI	4- 13	5 1/2	+ 7/8	+18.9
O	ODEC COMPUTER SYST.	2- 6	2	0	0.0
O	OPTICAL SCANNING	2- 7	3 3/4	+ 1/2	+15.3
O	PERTEC CORP	5- 8	5	- 1/4	-4.7
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	3- 9	4 3/8	+ 3/4	+20.6
O	PRECISION INST.	2- 6	2 3/4	0	0.0
O	QUANTOR CORP	6- 10	6	- 3/4	-11.1
O	RECOGNITION EQUIP	4- 8	5 1/4	+1 3/8	+35.4
N	SANDERS ASSOCIATES	7- 18	9 1/8	+1 1/8	+14.0
O	SCAN DATA	1- 6	2 1/4	+ 7/8	+63.6
O	STORAGE TECHNOLOGY	11- 34	17 1/2	+2 3/4	+18.6
O	SYCOR INC	9- 14	10 1/4	0	0.0
O	TALLY CORP.	2- 14	3 1/4	- 1/2	-13.3
O	TEC INC	6- 9	6 1/2	0	0.0
N	TEKTRONIX INC	30- 53	38 5/8	+3 1/8	+8.8
N	TELEX	3- 6	4 1/4	+ 3/4	+21.4
O	WANGCO INC	7- 13	9 1/2	+1 1/8	+13.4
O	WILTEX INC	8- 18	7 3/4	+ 1/4	+3.3
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	5- 9	5 3/4	0	0.0
A	BARRY WRIGHT	6- 13	8	+ 7/8	+12.2
A	DATA DOCUMENTS	17- 22	19 1/2	+2 1/8	+12.2
O	DUPLEX PRODUCTS INC	7- 10	8 1/4	+ 1/8	+1.5
N	ENNIS BUS. FORMS	5- 8	5 1/4	+ 1/4	+5.0
O	GRAHAM MAGNETICS	9- 20	12	+1	+9.0
O	GRAPHIC CONTROLS	8- 12	8 3/4	0	0.0
N	3M COMPANY	78- 89	83 7/8	+ 5/8	+0.7
N	MOORE CORP LTD	53- 60	56 1/4	- 1/4	-0.4
N	NASHUA CORP	42- 58	52 7/8	+3 3/8	+6.8
O	REYNOLDS & REYNOLD	40- 51	44	+1	+2.3
O	STANDARD REGISTER	14- 20	15 3/4	+ 3/4	+5.0
O	TAB PRODUCTS CO	10- 23	9 1/2	0	0.0
N	UARCO	15- 23	17	- 1/4	-1.4
A	WABASH MAGNETICS	5- 7	6 3/4	+1 1/4	+22.7
N	WALLACE BUS FORMS	15- 26	17 1/4	+1 5/8	+10.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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